

# **Artificial Intelligence, Employment, Education and Government Revenue: A Global Empirical Analysis**

## ● **ABSTRACT:**

- Artificial Intelligence (AI) is rapidly transforming the way organizations produce goods and services, deliver public services, and organize human work. The increasing adoption of machine learning, automation, and generative AI has created opportunities for productivity improvement, new occupations, and economic growth, while also creating concerns regarding occupational transformation, employment displacement, wage inequality, and workforce adaptation. The relationship between AI and employment is complex because AI can simultaneously automate certain tasks, augment human capabilities, and create demand for new skills and occupations.
- This study investigates the relationship between artificial intelligence, employment, education, wages, economic activity, and government revenue using internationally comparable country-level data. The study combines labour-market, education, economic, fiscal, and AI-exposure indicators from authoritative international sources. Particular attention is given to distinguishing **AI exposure from actual job displacement**, because potential exposure does not necessarily mean that an occupation or worker will be replaced.
- The research analyses changes in employment, unemployment, education, wages, and government revenue across countries and over time. It also examines whether countries with different levels of AI exposure exhibit different labour-market and economic patterns. Statistical methods including descriptive statistics, trend analysis, correlation analysis, and regression analysis may be used where sufficient data are available.
- The study aims to provide an evidence-based understanding of the economic and labour-market implications of AI and identify areas requiring further research, workforce development, and policy consideration.

## **KEYWORDS:**

Artificial Intelligence, Generative AI, Employment, Unemployment, Labour Market, Automation, Job Transformation, Wages, Education, Engineering Education, ICT, Productivity, Government Revenue, Economic Growth, AI Adoption, AI Exposure, Workforce Transformation, Labour Economics

## **1. INTRODUCTION**

### **1.1 Background:**

**Artificial Intelligence has evolved from a specialized research field into a widely used technology across business, government, education,**

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manufacturing, healthcare, finance, transportation, information technology, and other sectors. Recent developments in machine learning, deep learning, natural-language processing, computer vision, robotics, and generative AI have expanded the range of tasks that can be performed or assisted by computer systems.

- AI can affect employment through several mechanisms. First, organizations may use AI to automate repetitive or predictable tasks. Second, AI can augment workers by helping them perform existing tasks more quickly or accurately. Third, AI adoption can create demand for new occupations, technologies, services, and skills.
- The International Labour Organization's 2025 analysis estimates that approximately one in four workers globally are in occupations with some degree of exposure to generative AI, while emphasizing that exposure should not be interpreted as actual job loss.
- The relationship between AI and the economy therefore cannot be described simply as "AI creates jobs" or "AI destroys jobs." The outcome can depend on the industry, occupation, country, education system, level of technological adoption, labour-market institutions, and economic conditions.
- Education is particularly important in this context. Millions of students enter universities and technical institutions expecting that higher education will improve their employment opportunities. Engineering and information and communication technology (ICT) education are especially relevant because many occupations associated with these fields are closely connected to digital technologies.
- At the same time, governments depend on economic activity and employment for public revenue through taxes on income, consumption, corporate activity, and other economic activities. Consequently, changes in employment, wages, productivity, and business activity can potentially affect government finances.
- This study therefore examines AI not as an isolated technological phenomenon but as part of a broader relationship between:
- AI → Work → Employment → Income → Economic Activity → Government Revenue.

## **1.2 Problem Statement:**

The rapid development and adoption of AI has created uncertainty regarding its long-term effects on employment and economic structures.

Existing research demonstrates that some occupations and tasks have substantial potential exposure to AI, but exposure does not necessarily result in complete occupational replacement. At the same time, AI can increase productivity and create new tasks and occupations.

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A major research challenge is therefore to determine how AI-related technological change is associated with measurable changes in employment, unemployment, wages, education, productivity, and government revenue.

Another difficulty is that internationally comparable data are not available for every AI-related variable. For example, AI exposure data may be available at an **occupational level** while actual AI-related layoffs may not be available as a standardized annual country-level dataset.

Therefore, this research seeks to examine the available evidence systematically without assuming that observed economic changes are caused solely by AI.

## **1.3 :Research Gap:**

- Existing studies have examined different parts of the AI-economic relationship.
- Some studies examine:
  - AI and occupational exposure
  - Automation and employment
  - AI and productivity
  - AI and wages
  - AI and education
  - AI adoption by firms
- However, these variables are frequently examined separately.
- There is comparatively less work combining, within a single empirical framework:
  - AI exposure + education + employment + unemployment + wages + industry employment + economic activity + government revenue.
- Furthermore, country-level comparison is complicated by differences in statistical definitions, data availability, economic structures, and AI adoption levels.

## **1.4 Objectives :**

- Primary objective
  - To empirically examine the relationship between AI development and changes in employment, education, wages, economic activity, and government revenue across countries.
- Specific objectives
  - To measure available indicators of AI exposure and adoption.
  - To examine employment and unemployment trends.

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- To examine tertiary education and technical education indicators.
- To examine engineering and ICT education where internationally comparable data are available.
- To analyse wage-related indicators.
- To examine employment changes across agriculture, manufacturing, and services.
- To examine government tax revenue and other fiscal indicators.
- To compare economic and labour-market indicators across countries.
- To investigate statistical relationships between AI exposure and labour-market outcomes.
- To identify limitations in currently available AI-related economic data.
- To distinguish AI-related changes from broader economic changes.
- To provide evidence that can support further research into workforce and economic adaptation.

## **1.5 Research Questions:**

- Main Research Question
- How is the increasing exposure to and adoption of Artificial Intelligence associated with employment, education, wages, economic activity, and government revenue across countries?
- Sub-questions
- RQ1: How does potential AI exposure differ across countries, occupations, and income groups?
- RQ2: What employment and unemployment trends are observed during periods of increasing AI adoption?
- RQ3: What relationship exists between AI exposure and wages?
- RQ4: How are engineering and ICT education systems changing in relation to technological transformation?
- RQ5: What changes occur in employment across agriculture, manufacturing, and services?
- RQ6: What relationship exists between employment, economic activity, and government revenue?
- RQ7: Do countries with different levels of AI exposure demonstrate different labour-market patterns?
- RQ8: What proportion of observed labour-market changes can reasonably be associated with AI, and what changes may be explained by other factors?

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## **1. LITERATURE REVIEW:**

- The literature review will establish what researchers already know and identify where the current study contributes.



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## 2.1 AI and Employment:

- AI can influence employment through automation, augmentation, and the creation of new activities.
- Automation
- AI can perform or assist tasks that were previously performed by humans.
- Examples include:
  - Data processing
  - Document classification
  - Customer support
  - Image analysis
  - Code assistance
  - Quality inspection
  - Predictive maintenance
- Augmentation
- AI can also increase worker productivity without eliminating the worker.
- Examples include:
  - AI-assisted programming
  - AI-assisted medical diagnosis
  - AI-assisted engineering design
  - AI-assisted writing
  - AI-assisted data analysis
- Therefore:
- AI exposure  $\neq$  job replacement.
- The ILO estimates that approximately 25% of global employment is potentially exposed to generative AI, while emphasizing that transformation is more likely than complete replacement for many occupations.
- The research will therefore separately analyse:
  - Exposure → Transformation → Actual employment outcome
  - rather than treating all exposure as displacement.

## 3. CONCEPTUAL FRAMEWORK

### 3.1 Relationship Between AI, Education and Skills

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- The conceptual framework begins with AI as a technological development that may change the skills required by employers. Changes in skill demand may influence students' educational choices, university programs, professional training and graduate outcomes. The research will therefore investigate whether changes in AI-related labour demand are associated with changes in education patterns, particularly in areas such as engineering, information technology, computer science and other technology-related fields .

## **3.2 Relationship Between Skills and Job Patterns**

- Changes in education and skills may influence the supply of workers entering different occupations, while technological development may simultaneously change employer demand. This section of the framework examines the relationship between graduate supply, occupational demand and job patterns. It will consider whether particular occupations are expanding, declining or undergoing task transformation and whether these patterns differ across countries and industries.

## **3.3 Relationship Between Employment and Income**

- Employment and income are closely related economic variables. Changes in employment may affect the number of people receiving labour income, while changes in occupational demand may affect wages. The framework therefore examines employment, unemployment, wages and income together. The research will determine whether changes in AI exposure are statistically associated with these indicators after considering other relevant economic factors.

## **3.4 Relationship Between Income and Government Revenue**

- Income, employment, business activity and consumption contribute to different components of government revenue through mechanisms such as income taxation, corporate taxation and consumption-related taxation. The research will therefore examine whether changes in employment and income correspond with changes in government tax revenue. This relationship will be analysed empirically rather than assuming that a reduction in one indicator automatically produces an equivalent reduction in government revenue .

## **3.5 Overall Economic Cycle**

- The complete conceptual framework connects AI, education, skills, jobs, employment, **wages, economic activity, productivity and government revenue**. The framework recognizes that the relationship may operate in multiple directions. AI may transform some existing occupations while creating demand for other occupations; productivity gains may affect output and income; and changes in economic activity may subsequently influence government revenue. This framework provides the basis for the statistical analysis conducted in the study.

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## **4. METHODOLOGY**

### **4.1 Research Design**

- This study uses a quantitative, comparative and longitudinal research design based on country-level observations across multiple years. The principal unit of analysis is the country-year, allowing the research to examine how indicators change over time and how relationships differ between countries. The study will use historical data rather than relying primarily on opinions or assumptions about the future effects of AI.

### **4.2 Data Sources**

- The research will prioritize official and internationally recognized sources. These include the International Labour Organization and ILOSTAT for labour-market indicators, the World Bank for economic, education and employment indicators, UNESCO Institute for Statistics for education data, the IMF for government finance and economic information, OECD datasets for participating countries, and national statistical agencies for country-specific information. Each observation in the final dataset will be linked to its original source, indicator definition, year and unit of measurement.

### **4.3 Variables**

- The independent or explanatory variables will include available indicators relating to AI exposure, AI adoption and technological development. Education variables may include tertiary enrollment, student numbers, graduates and field-specific education where internationally comparable data exist. Employment variables may include employment rates, unemployment rates, youth unemployment and employment by industry or occupation. Economic variables may include GDP, GDP per capita and productivity. Income variables may include wages and wage growth. Government variables may include tax revenue, government revenue and government expenditure.

### **4.4 Data Collection**

- Data will be collected only when an identifiable official or reliable international source provides the corresponding indicator. The country, year, value, unit, source, indicator code and definition will be recorded. Where a particular value is unavailable, the dataset will record it as "NA – Not Available" rather than estimating a value without an appropriate methodology. Where indicators from different sources are not sufficiently comparable, the dataset will identify them as "NC – Not Comparable." This approach is intended to prevent fabricated or misleading data from entering the research dataset.

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## 4.5 Statistical Methods

- The study will initially use descriptive statistics and trend analysis to understand historical changes. Percentage changes will be calculated where appropriate, followed by correlation analysis to identify relationships between variables. Regression and panel-data methods may then be applied when the available data and assumptions support them. The models may examine relationships such as AI exposure and employment, AI exposure and wages, and employment or income and government revenue. Control variables such as GDP, inflation, population, industry structure and major economic shocks may be incorporated where appropriate. Statistical association will not automatically be interpreted as proof of causation.

## 5. RESULTS

### 5.1 AI Adoption

- This section will present the available official measurements of AI exposure and adoption by country, industry or occupation. The analysis will identify differences between countries and income groups and examine how AI-related indicators have changed over time. Where a global standardized AI-adoption indicator is unavailable, the research will clearly identify the limitation rather than combining incompatible measurements.

### 5.2 Employment

- This section will present employment, unemployment and youth-unemployment trends using official labour-market data. Employment will also be examined by industry and occupation where comparable information exists. The analysis will investigate whether countries with different levels of AI exposure show different employment patterns while considering other economic factors that may influence employment.

### 5.3 Wages

- The wage analysis will examine wage levels and changes over time, including differences across occupations or industries where suitable data exist. The purpose is to determine whether technological and AI-related changes are associated with measurable wage differences. Both potential positive effects, such as productivity-related wage increases, and potential negative effects, such as reduced demand for certain tasks, will be considered.

### 5.4 Government Revenue

- This section will analyse tax revenue and other government-revenue indicators over time. The analysis will examine whether changes in employment, wages, GDP and productivity are associated with changes in

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government revenue. The results will not assume that AI reduces government revenue; instead, the data will be used to determine whether the observed relationship is positive, negative, mixed or statistically insignificant .

## **5.5 Country Comparison**

- Countries will be compared using indicators that are sufficiently comparable across countries and years. The comparison may include AI exposure, education, employment, unemployment, wages, GDP, productivity and tax revenue. Differences will be described using the actual measured values rather than assigning countries subjective rankings such as "best" or "worst."

## **6. DISCUSSION**

### **6.1 AI and Education Patterns**

- The discussion will interpret whether changes in AI and technology appear to correspond with changes in education enrollment, graduate numbers and fields of study. It will consider whether students and educational institutions may be responding to changing labour-market requirements. However, the research will distinguish between observed changes in education data and assumptions about why students made particular choices .

### **6.2 AI and Changing Job Patterns**

- This section will discuss how occupational and industrial employment structures are changing. It will consider evidence of task transformation, automation, augmentation and emerging occupations. The analysis will avoid interpreting occupational AI exposure as automatic job elimination and will distinguish between documented employment changes and theoretical AI effects.

### **6.3 AI and Employment**

- The employment discussion will combine AI indicators with employment and unemployment results. The study will examine whether measurable statistical relationships exist and whether those relationships remain after considering other economic variables. Differences between countries will also be discussed because labour markets, education systems, industrial structures and government policies differ substantially.

### **6.4 AI and Income**

- This section will interpret the wage and income results. It will examine whether AI-related technological changes appear to benefit certain skills or occupations more than others and whether there are measurable differences in wage trends. The discussion will also consider whether productivity changes and employment changes may operate through

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different channels.

## **6.5 AI and Economic Growth**

- The research will examine the relationship between AI-related indicators, productivity and GDP. If countries or sectors experience productivity improvements alongside AI adoption, the analysis will determine whether the available evidence supports an association. Because GDP and productivity are affected by numerous factors, AI will not automatically be treated as the sole explanation for observed economic growth.

## **6.6 AI and Government Revenue**

- The discussion will connect employment, income, economic activity and government revenue. The research will consider two competing possibilities: AI-related displacement could reduce some sources of taxable income, while AI-related productivity, investment, business expansion and new employment could increase other sources of tax revenue. The actual country-level evidence will determine which relationships are observed.

## **6.7 Education–Employment Mismatch**

- This section will investigate whether the skills produced by educational systems correspond with changing labour-market requirements. If the data show increasing demand for certain skills while educational supply remains unchanged, this may indicate a potential skills mismatch. Such findings will be described carefully because education and employment outcomes are influenced by many factors.

## **6.8 Overall Economic Transformation**

- The final discussion section will integrate the individual findings into the broader framework. It will examine whether AI appears primarily associated with job transformation, employment changes, productivity improvements, new economic activity or combinations of these outcomes. The purpose is to understand the overall structural transformation rather than focusing only on job losses.

# **7. POLICY IMPLICATIONS**

## **7.1 Education and Curriculum Adaptation**

- If the evidence indicates that labour-market skill requirements are changing, the findings may provide useful information for educational institutions and workforce-development programs when considering curriculum and skill development. Any recommendations will be based on observed evidence rather than assuming that one particular educational approach is universally appropriate.

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## 7.2 Reskilling and Upskilling

- If the analysis identifies occupational transformation or changing skill requirements, governments, educational institutions and organizations may need to consider reskilling and upskilling programs. The research will identify this as an evidence-based consideration rather than assuming that all workers require the same training .

## 7.3 Employment Transition

- Where the data indicate substantial occupational transformation, employment-transition mechanisms may become relevant. These could include career guidance, skills programs, job-matching systems and support for workers moving between occupations. The research will describe possible areas of consideration based on the observed labour-market evidence.

## 7.4 AI Adoption and Human–AI Collaboration

- The research may provide evidence relevant to organizations deciding how AI can be integrated with human work. The focus will be on understanding whether AI is being used primarily for task automation, worker augmentation, productivity improvement or the creation of new activities.

## 7.5 Labour-Market Monitoring

- Because AI technology is developing rapidly, governments and statistical institutions may need improved systems for measuring AI adoption, AI-related occupational changes and emerging occupations. Better data would allow future researchers to distinguish more accurately between AI exposure, AI adoption and actual employment outcomes.

## 7.6 AI and Fiscal Planning

- If the research identifies measurable relationships between employment, income, economic activity and tax revenue, governments may need to consider these relationships when conducting long-term fiscal planning. The study will not assume that AI will either reduce or increase government revenue; the purpose is to identify the mechanisms and empirical relationships that should be monitored.

## 7.7 Government AI Adoption

- Evidence concerning government AI adoption may help explain how public-sector productivity and service delivery could change. This section will focus on documented government applications and measurable outcomes rather than making unsupported assumptions about future government performance .

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## **8. LIMITATIONS**

- The study will have several limitations. AI-specific data are relatively new and are not available consistently for every country and every year. Different countries also use different definitions for employment, unemployment, education, taxation and government revenue. AI exposure is not equivalent to AI adoption, and AI adoption is not equivalent to actual job displacement. Economic events such as COVID-19, inflation, financial crises, demographic changes and policy reforms may influence employment and government revenue independently of AI. Furthermore, statistical association does not by itself establish causality. These limitations will be explicitly considered when interpreting the findings and predictions.

## **9. PROPOSED INTERNATIONAL ARTIFICIAL INTELLIGENCE IMPACT AND GOVERNANCE BOARD**

### **9.1 Introduction to the Proposed Board**

- **9.2 Purpose of the Proposed Board**
- The main purpose of the proposed IAIGB would be to study the global impact of AI using reliable country-level evidence. Instead of examining AI only from a technological perspective, the board would consider its wider effects on students, education systems, workers, industries, businesses, governments and economies. It would examine whether AI is associated with changes in the types of skills required, the number and structure of jobs, employment and unemployment, wages, productivity, economic activity and government revenue. The board would use official government and international data wherever available and would distinguish observed facts from statistical findings and future predictions.

### **9.3 International Country Representation**

- The proposed board would include participation from countries representing different levels of economic development, technological adoption, education systems and labour-market structures. This international representation is important because the effects of AI may not be identical across countries. Countries with different levels of digital infrastructure, industrial development, education, wages and employment structures may experience different outcomes from the same AI technology. The proposed board would therefore examine country-specific evidence rather than assuming that one AI policy or outcome applies equally to every country.

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## 9.4 AI, Education and Skill Assessment

- One responsibility of the proposed board would be to monitor how AI affects education and skill requirements. AI may change the types of tasks performed in workplaces, which could influence the skills employers demand and the subjects students choose to study. The board would therefore examine indicators such as tertiary education enrollment, engineering and ICT education, graduate numbers, emerging skills and labour-market requirements. The objective would be to identify whether education systems are changing in response to technological developments and whether potential gaps exist between graduate skills and changing employment requirements.

## 9.5 AI and Job Pattern Assessment

- The proposed board would examine changes in occupational and industry-level job patterns. AI can potentially automate some tasks, assist workers with other tasks and create demand for new occupations and services. Therefore, the assessment would not define AI simply as a job-destruction technology. Instead, the board would examine evidence of job transformation, job creation, job displacement and human-AI collaboration. Where international organizations identify occupations with potential AI exposure, the research would distinguish such exposure from actual job losses.

## 9.6 AI Restriction and Regulation Assessment

- A major function of the proposed board would be to examine the possible effects of different levels of AI restriction or regulation. The purpose would not be to automatically support or oppose restrictions. Instead, the board would assess how different regulatory scenarios could affect employment, education, productivity, innovation, economic growth, wages and government revenue. The analysis would recognize that regulation may produce both potential benefits and potential costs, depending on the type of AI application, the country, the industry and the policy design.

## 9.7 International AI Policy Scenarios

- The research could develop several hypothetical scenarios for analysis. A Baseline Scenario would represent continued AI development under existing conditions. A Limited Regulation Scenario would represent basic safety, transparency and accountability requirements. A Moderate Regulation Scenario would represent additional controls on selected high-risk AI applications. A Strong Restriction Scenario would represent substantial limitations on selected AI uses. A High AI Adoption with Safeguards Scenario would represent rapid AI adoption combined with governance and safety mechanisms. These scenarios would be analytical models rather than claims about what governments should actually implement.

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## 9.8 AI, Employment, Income and Government Revenue

- The proposed board would examine the relationship between AI-related changes in employment and government revenue. If AI reduces demand for certain tasks, some workers may experience occupational transitions, unemployment or changes in income, which could affect certain parts of the tax base. At the same time, AI may increase productivity, create new occupations, increase business activity and generate new sources of taxable income. The board would therefore examine both possibilities rather than assuming that AI will necessarily reduce or increase government revenue.

## 9.9 International AI Impact Assessment

- The proposed board would conduct an International AI Impact Assessment using country-level historical data. The assessment would combine indicators relating to AI, education, employment, unemployment, wages, GDP, productivity and government revenue. Countries could be analysed across multiple years to determine how these indicators changed over time and whether statistically measurable relationships exist between them. The assessment would also consider differences in economic structure, education systems, labour markets and government finance.

## 9.10 Data and Evidence System

- The proposed board would establish a standardized evidence system in which every important observation is connected to its original source. Data would preferably be obtained from organizations such as national governments, ILO, ILOSTAT, World Bank, UNESCO, IMF and OECD. Each observation would include the country, year, indicator, value, unit, source and definition. If data are unavailable, the research would record NA – Not Available rather than creating a value. If data from two sources cannot reasonably be compared, they would be identified as NC – Not Comparable.

## 9.11 Statistical Assessment

- The proposed board would use statistical methods to evaluate the relationships identified in the research. Descriptive statistics and trend analysis would first be used to understand historical changes. Correlation analysis could then examine whether variables move together, while regression and panel-data models could be used where the data support them. The analysis could examine relationships such as AI exposure and employment, AI exposure and wages, employment and government revenue, and productivity and government revenue. Statistical association would not automatically be interpreted as proof that AI caused a particular outcome.

## 9.12 Future Prediction

- After historical data have been analysed, the research could develop

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statistical models to estimate possible future outcomes under different AI scenarios. These predictions could include future employment, unemployment, wages, GDP, productivity and government revenue. The predictions would be generated by the research model and would not be presented as official government forecasts. Every prediction would clearly identify the assumptions, historical data period, variables and limitations used to generate it. This separation would ensure that official observations and research-generated predictions are not confused.

### 9.13 Evidence-Based International Recommendations

- The proposed board would use the results of the International AI Impact Assessment to identify areas that may require further attention. These could include education and curriculum development, workforce reskilling, employment transition, AI governance, labour-market monitoring, government AI adoption and fiscal planning. The board would not begin with a predetermined conclusion that AI should be restricted or unrestricted. Instead, any recommendation within the research framework would depend on the evidence, the country context and the objectives being examined .

### 9.14 Overall Role of the Proposed Board

- **The proposed** International Artificial Intelligence Impact and Governance Board (IAIGB) **would provide the central international framework for evaluating the relationship between AI and society, labour markets and economies.** Its proposed role would be to connect AI development with education, skills, employment, income, productivity, economic activity and government revenue while examining alternative AI governance and restriction scenarios. By combining official data, statistical analysis and clearly identified predictions, the proposed board would provide a structured framework for understanding possible global consequences of AI and for identifying areas where additional evidence and research are required .

### 9.15 Decision-Making Powers of the Proposed Board

- **The proposed** International Artificial Intelligence Impact and Governance Board (IAIGB) **would have defined powers to establish international AI governance standards, assess the economic and social consequences of AI, approve or reject specified categories of high-risk AI applications under the proposed international framework, and require participating countries or organizations to conduct impact assessments before deploying designated high-risk AI systems.** The board would also have the authority to establish minimum international requirements relating to AI safety, transparency, accountability, employment impact assessment and protection of critical public services. Its decisions would be based on technical evidence, country-level data, economic analysis and periodic impact assessments rather than predetermined assumptions about whether AI is beneficial or harmful.
- The board would have the power to classify AI applications according to risk

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levels. Low-risk applications could continue under general standards, while high-risk applications could be subject to additional assessment, monitoring or temporary restrictions. Applications considered to present substantial and demonstrable risks could be placed under a defined international restriction framework until the required safety or impact conditions were satisfied. The board would periodically review such classifications because AI technology, economic conditions and available evidence may change over time.

- The board would also have the authority to establish international AI impact-assessment requirements. Before a participating country or organization deploys AI in designated high-impact areas such as employment, education, critical infrastructure, public administration or essential services, an impact assessment could be required. The assessment would examine potential effects on employment, skills, privacy, safety, economic activity, government expenditure and other relevant indicators. The board could require additional evidence or mitigation measures where an assessment identifies significant unresolved risks.
- Another decision power would involve international monitoring and compliance reporting. Participating countries would periodically submit information concerning AI adoption, major AI deployments, employment effects, regulatory measures and relevant economic indicators. The board would analyse these reports alongside official statistical data. Where a participating jurisdiction fails to meet agreed standards, the board could issue a formal compliance notice and require a corrective plan within a specified period.
- The board could also have authority to impose defined international measures for serious non-compliance, but these powers would need to be established through the international agreement creating the board. Possible measures in your hypothetical framework could include suspension of authorization under the international framework, restrictions on participation in designated international AI programs, or referral of serious disputes to an agreed international dispute-resolution mechanism. The research should specify that these powers would exist only if countries formally delegated them to the board.
- Importantly, the board would not automatically possess unlimited authority over national governments. National governments would retain authority over matters that remain within their domestic jurisdiction unless they voluntarily transfer specific powers through an international treaty or agreement. This distinction makes the proposed institution more realistic: the board would have only those international powers that participating countries formally agree to provide.

### 9.16 Emergency Decision Power

- The proposed board could also have a limited emergency authority for

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situations in which an AI system creates a serious and immediate international risk. Under predefined conditions, the board could issue a temporary international suspension or restriction on a specified AI application while an emergency assessment is conducted. Such emergency decisions would have a fixed maximum duration, require documented evidence, and be subject to review by the board and participating countries.

## **9.17 Review and Appeal Power**

- Any major decision of the board would be subject to a formal review process. A country, organization or other authorized participant affected by a decision could request reconsideration by presenting additional technical, economic or safety evidence. The board would be required to publish the reasoning, evidence and applicable criteria behind major decisions. This would make the decision-making process transparent and allow decisions to be changed when new evidence becomes available.

## **9.18 Limits on the Board's Powers**

- The proposed IAIGB would have clearly defined limits. It would not have unrestricted authority to control all AI development worldwide, determine the education or employment policies of individual countries, or make economic predictions binding on governments. Its powers would be limited to the areas explicitly delegated to it through the proposed international agreement. This separation between international authority and national sovereignty would be an important part of the board's governance structure .

## **10. FINAL CONCLUSION**

Artificial Intelligence is not only a technological development but also a major factor capable of influencing education, skills, employment, job patterns, income, productivity, economic activity and government revenue. This research examined these relationships from a country-level and international perspective rather than assuming that AI will produce the same outcome in every economy. The analysis recognizes that AI may automate certain tasks, transform existing occupations, support human workers and create new forms of employment at the same time. Therefore, the overall impact of AI must be evaluated through measurable evidence rather than through the assumption that technological progress will necessarily result in either widespread job loss or universal economic growth.

The research also highlights the changing relationship between education and employment. As AI changes workplace tasks and skill requirements, education systems may need to respond to changes in labour-market demand. The future workforce may require a combination of technical knowledge, AI literacy, analytical ability, communication skills and domain expertise. Changes in student enrollment, graduate patterns and employment opportunities should therefore be studied together rather than as separate issues. Understanding this relationship is important for students, educational institutions, employers and governments when

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planning for future workforce requirements.

A further focus of this research is the relationship between employment, income and government revenue. Changes in employment and wages can influence household income, consumption, business activity and parts of the tax base. However, AI can also increase productivity, create new businesses, generate new occupations and increase economic output. Consequently, the effect of AI on government revenue cannot be predetermined. It must be measured through country-level evidence while considering taxation systems, economic growth, employment structures, productivity and other factors that influence public revenue.

The proposed **International Artificial Intelligence Impact and Governance Board (IAIGB)** provides a conceptual framework for continuously monitoring these changes at the international level. The proposed board would not assume that one policy is appropriate for every country. Instead, it would compare evidence from different economies, evaluate potential AI risks and benefits, examine alternative regulatory scenarios and monitor changes in education, employment, income, productivity and government revenue. Its proposed decision-making framework would also require periodic reassessment because the effects of AI may change as technology, labour markets and economic conditions develop.

Overall, this research establishes a framework for understanding AI as part of a broader **education–employment–economic–government cycle**. The central finding of the research framework is that the impact of AI should not be measured using a single indicator such as unemployment or job displacement. A meaningful assessment requires multiple dimensions, including education patterns, skills, occupational changes, employment, unemployment, wages, productivity, economic activity and government revenue. The long-term consequences of AI will depend not only on the technology itself but also on how education systems, workers, businesses and governments respond to technological change.

Therefore, the future of AI should be studied through continuous measurement, transparent data, international comparison and evidence-based analysis. Rather than treating AI as inherently beneficial or harmful, this research provides a framework for identifying where AI is transforming work, where new opportunities are emerging, where adjustment challenges may occur and where further evidence is required. This approach can support future researchers and policymakers in understanding the changing relationship between artificial intelligence, human capital, employment and economic development.

## **11. RESEARCH CONTRIBUTION**

This research contributes a unified framework connecting **AI, education, skills, employment, income, productivity, economic activity and government revenue** within a single country-level analytical model. It also distinguishes between AI exposure and actual employment outcomes, thereby avoiding the assumption that technological exposure automatically results in job loss. The research further proposes a structured international governance framework through the hypothetical IAIGB and

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introduces scenario-based analysis for examining different levels of AI adoption, regulation and restriction.

A further contribution is the emphasis on transparent data collection. The research framework requires every observation to be connected to its country, year, indicator, unit, definition and original source. Missing or non-comparable information is explicitly identified instead of being estimated without evidence. This approach improves the reproducibility of the research and allows future researchers to update the dataset as new international data become available.

## **12. FUTURE SCOPE OF THE RESEARCH**

Future research can extend this study by incorporating larger country-level datasets, more detailed occupational information, AI adoption measurements, company-level employment data and longer time periods. Future studies could also examine specific industries such as information technology, manufacturing, finance, healthcare, education, transportation and public administration separately.

Advanced econometric methods could be applied when sufficient longitudinal data become available to examine potential causal relationships between AI adoption and labour-market outcomes. Future research could also develop country-specific AI impact models and compare different AI governance scenarios using measurable economic indicators.

As AI technology continues to develop, the dataset and proposed international assessment framework can be periodically updated. New evidence on generative AI, autonomous systems, robotics, AI-assisted employment and emerging occupations can be incorporated into subsequent versions of the research. This would allow the study to evolve from a static analysis into a continuously updated framework for monitoring the long-term relationship between artificial intelligence, human capital, employment and economic development.

## **DATA AVAILABILITY AND REPRODUCIBILITY**

The quantitative dataset developed for this research is organized at the country-year level wherever comparable data are available. Each observation is intended to contain the country, year, indicator, value, unit of measurement, source, indicator code and relevant definition. The research prioritizes publicly available information from recognized international organizations and official statistical institutions.

The principal sources include the International Labour Organization and ILOSTAT for labour-market indicators, the World Bank for economic, education and employment indicators, UNESCO Institute for Statistics for education statistics, the International Monetary Fund for government finance and macroeconomic information, and OECD datasets for participating countries. Country-specific official statistical agencies may also be used where internationally comparable information is unavailable.

To maintain transparency, missing observations are recorded as **NA – Not Available** rather than being replaced with unsupported values. Where observations cannot reasonably be compared because of differences in definitions, methodology or

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coverage, they are recorded as **NC – Not Comparable**. Estimates are retained only when the original source identifies them as estimates.

The dataset should also record the access date for continuously updated online databases. This is important because international statistical databases may be revised after their initial publication. The final research dataset and the analytical results should therefore be interpreted according to the data version and access date documented in the research records.

The dataset is intended to support reproducibility by allowing another researcher to identify the origin and definition of each major observation. Calculated indicators, including percentage changes and statistical measures, should be derived from the documented source observations rather than entered as unexplained values.

## **DATA QUALITY AND MISSING DATA**

Data quality is an important consideration in a global comparative study because countries differ in statistical systems, reporting standards, definitions and data availability. The research therefore does not assume that an indicator with the same name is automatically identical across all countries.

Three categories are used when recording observations. **NA – Not Available** is used when a reliable value cannot be obtained for the required country and year. **NC – Not Comparable** is used when information exists but differences in definitions, measurement methods or coverage make direct comparison inappropriate. **EST – Estimate** may be used where the original source explicitly identifies the observation as an estimate.

Particular attention is given to AI-related indicators because internationally standardized measurements of AI adoption, AI-related layoffs and actual AI-driven job displacement remain more limited than conventional labour-market indicators. Potential occupational exposure to generative AI is therefore not treated as equivalent to actual job replacement.

The analysis also considers broader economic factors that may influence employment and government revenue independently of AI, including economic growth, inflation, demographic changes, major economic shocks, industry structure and policy changes. These factors are important when interpreting statistical relationships between AI-related indicators and economic outcomes.

## **Add the Data Dictionary**

This should ideally also appear as an **Excel sheet**.

| <b>Variable</b> | <b>Description</b> | <b>Unit</b> | <b>Possible Source</b> |
|-----------------|--------------------|-------------|------------------------|
| Country         | Country name/code  | Country     | World Bank/<br>ILO     |

## **Artificial Intelligence, Employment, Education and Government Revenue: A Global Empirical Analysis**

| Year                  | Observation year                                         | Year                      | Source dataset    |
|-----------------------|----------------------------------------------------------|---------------------------|-------------------|
| Employment Rate       | Share of working-age population employed                 | %                         | ILO/World Bank    |
| Unemployment Rate     | Unemployment as a share of labour force                  | %                         | ILO/World Bank    |
| Youth Unemployment    | Unemployment among young people                          | %                         | ILO/World Bank    |
| Tertiary Enrollment   | Gross tertiary enrollment ratio                          | %                         | UNESCO/World Bank |
| Student Count         | Number of students where available                       | Persons                   | UNESCO/OECD       |
| Graduates             | Number of graduates where available                      | Persons                   | UNESCO/OECD       |
| ICT Education         | Students/graduates in ICT fields where available         | Persons/%                 | UNESCO/OECD       |
| Engineering Education | Students/graduates in engineering fields where available | Persons/%                 | UNESCO/OECD       |
| Wages                 | Wage/labour-income indicator                             | Source-specific           | ILO/OECD          |
| GDP                   | Gross domestic product                                   | Current/constant currency | World Bank/IMF    |
| GDP per Capita        | GDP relative to population                               | US\$/currency             | World Bank        |
| Productivity          | Output per worker/hour where available                   | Source-specific           | ILO/OECD          |
| Tax Revenue           | Tax revenue relative to GDP                              | % GDP                     | World Bank/IMF    |

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|                        |                                   |                     |                |
|------------------------|-----------------------------------|---------------------|----------------|
| Government Revenue     | Government revenue indicator      | % GDP/currency      | World Bank/IMF |
| Government Expenditure | Government expenditure indicator  | % GDP/currency      | World Bank/IMF |
| Source                 | Original data provider            | Text                | Dataset        |
| Indicator Code         | Original indicator identifier     | Text                | Dataset        |
| Definition             | Source definition                 | Text                | Dataset        |
| Data Status            | Availability/comparability status | NA/NC/EST/Available |                |

## **RESULTS AND EMPIRICAL ANALYSIS**

### **AI Exposure and Adoption**

This section presents the available country-level indicators of potential AI exposure and AI adoption. The analysis compares countries and, where sufficient observations exist, income groups and periods. AI exposure is interpreted as potential occupational exposure rather than evidence of actual job displacement.

#### **5.2 Education and Student Patterns**

The analysis examines tertiary enrollment, student numbers, graduates and field-specific education indicators where comparable data are available. Particular attention is given to engineering, information and communication technology and other technology-related fields. Changes are examined across years to identify whether education patterns have changed during periods of technological transformation.

#### **5.3 Employment and Unemployment**

Employment and unemployment indicators are analysed across countries and years. Where comparable data are available, the analysis also examines youth unemployment and employment by economic activity or occupation. Observed changes are interpreted alongside broader economic conditions rather than being attributed automatically to AI.

#### **5.4 Job Pattern and Industry Changes**

This section examines changes in employment across agriculture, manufacturing and services and, where reliable data are available, across specific occupations. The objective is to identify patterns of occupational transformation, expansion or contraction associated with broader technological and economic changes.

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## **5.5 Wages and Income**

Wage and income indicators are analysed to examine whether labour-market changes are accompanied by changes in worker income. Where data permit, differences between countries and economic sectors are examined.

## **5.6 Economic Activity and Productivity**

GDP, GDP per capita and productivity indicators are analysed to examine broader economic changes occurring alongside technological development. The analysis considers whether observed economic changes coincide with changes in employment and labour-market indicators.

## **5.7 Government Revenue and Tax Revenue**

Government revenue and tax revenue indicators are examined alongside employment, income and economic activity. The analysis does not assume that AI reduces or increases government revenue. Instead, it investigates the observed relationship between these variables while considering differences in national fiscal systems.

## **5.8 Country-Level Comparison**

Countries are compared using indicators that are sufficiently comparable across the selected years. The analysis identifies differences in patterns rather than assigning countries overall rankings.

## **5.9 Statistical Relationships**

Where the dataset provides sufficient observations, correlation and regression analyses are used to examine relationships between AI-related indicators and employment, wages, productivity and government revenue. Statistical association is not interpreted as proof of causality.

## **5.10 Summary of Empirical Findings**

The final findings will summarize the statistically and descriptively supported relationships identified in the dataset. Findings will distinguish between observed trends, statistical associations and possible explanations. Any result that cannot be supported by sufficient data will be identified as a limitation rather than presented as a confirmed finding.

# **13. FINAL STATEMENT**

Artificial Intelligence is changing the relationship between technology and human economic activity. The important question is therefore not simply whether AI will replace humans, but how education systems, workers, businesses and governments will adapt as the structure of work changes. By connecting education, skills, jobs, income, productivity, economic activity and government revenue within one analytical framework, this research provides a foundation for studying that

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transformation using measurable evidence. The future impact of AI remains dependent on technological development, economic conditions, institutional responses and human adaptation; therefore, continued international research and reliable country-level data will be essential for understanding the direction and scale of this transformation.

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- United Nations Conference on Trade and Development (UNCTAD). *Technology and Innovation Reports* . United Nations.
- World Economic Forum. *Future of Jobs Report* . World Economic Forum.
- European Commission. *AI Act – Regulatory Framework for Artificial Intelligence* . European Union.
- Data and Methodology Note
- The quantitative analysis in this research should use officially published or otherwise clearly documented datasets. Country-level observations should retain their original source, year, unit and indicator definition. Where data are unavailable, the value should be recorded as NA (Not Available) rather than estimated without supporting evidence. Where indicators from different sources are not directly comparable, they should be identified as NC (Not Comparable). AI exposure should not be interpreted as equivalent to actual job displacement or unemployment.
- Source Access Dates
- For online datasets that are continuously updated, the research should record the date on which the data were accessed in the final Excel dataset and methodology documentation. This is particularly important for ILOSTAT, World Bank, UNESCO UIS, OECD and IMF databases because their datasets can be revised over time.
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