

12<sup>th</sup> IMF Statistical Forum

MEASURING THE IMPLICATIONS OF  
**AI ON THE  
ECONOMY**

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#StatsForum

# AI Investment Potential Index: Mapping Global Opportunities for Sustainable Development

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# Why AI-IPI? Addressing an Evolving Landscape

AI is set to reshape the global economy, but not all regions are ready.

Global AI investments are surging, yet potential is unevenly distributed across regions.

The AI-IPI: Focused on **identifying untapped AI investment potential**, especially in developing economies.

- **Guide** development institutions, investors, and governments toward informed AI investment.
- A solution for investors and policymakers to focus resources where they will have the most transformative impact.

## Why another Index?

Explicit choice of what we are trying to explain/forecast (*Number of AI investment in a country*)

Selection and weighting of Index-component variables based on a model/models (no *a priori* equal weighting of variables). No author's preferences bias.

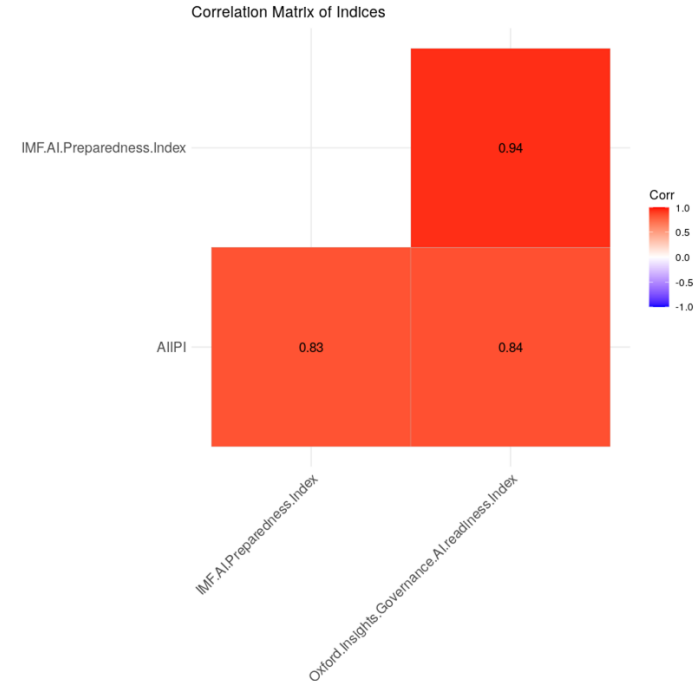
Statistical work to design a –relatively- parsimonious model and avoid redundancy

Replicability/adaptability of the index (based on publicly available data / [opendata.afd.fr](https://opendata.afd.fr))

# Distinctiveness of the AI-IPI: A Comparative Overview

## AIPI vs. IMF AI Preparedness Index and Oxford Insights Governance AI Readiness Index

- The AIPI **focuses on a country's attractiveness for AI investments**, including investment-oriented, economic, and market-specific indicators.
- The IMF and Oxford indices primarily focus on **AI readiness**, evaluating governance quality, regulatory frameworks, and institutional strength.
- While the AI-IPI shows correlation with these indices, it provides **an analysis of the conditions that investors prioritize**, offering new insights into AI investment potential across different regions.



# Key Indicators

## 1. Infrastructure

- **Access to Electricity:** Essential for AI infrastructure.
- **GSMA Connectivity Index & Telecommunication Infrastructure Index:** Gauge digital connectivity.

## 2. Economic Capacity

- **Log GDP per Capita PPP & Population:** Assess financial resources and market potential.

## 3. Governance

- **Government Effectiveness, Political Stability, Voice and Accountability:** Evaluate public services, regulatory environment, and stability.

## 4. Human Capital & Innovation

- **Human Capital Index:** Measures skilled talent availability.
- **Research Articles & Statistical Data Capacity:** Reflect research ecosystem and data management capabilities.

## 5. AI Strategy & Data Privacy

- **National AI Strategy:** Government commitment to AI development.
- **Data Privacy and Protection Score:** Ensures data security measures.

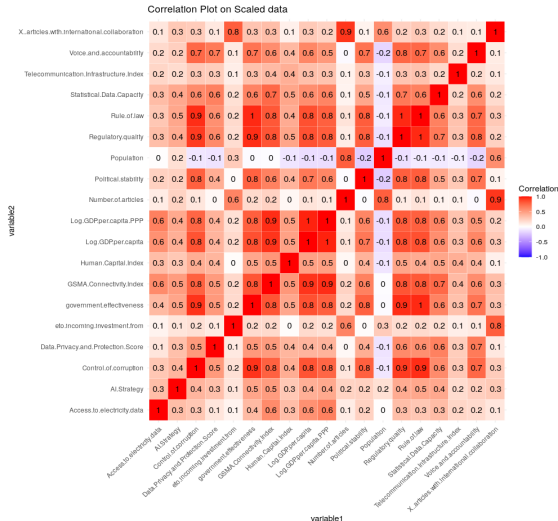
# Methodology

## Rescaling (min-max normalization)

$$x' = \frac{x - \min(x)}{\max(x) - \min(x)} * 100$$

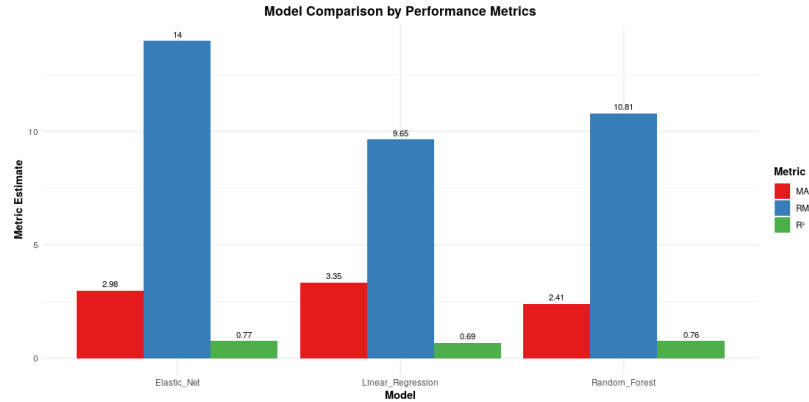
where  $x$  is an original value,  $x'$  is the normalized value.

## Variable Selection to reduce redundancy



## Approach to Weighting Strategy

### Model Comparison by Performance Metrics



### Entropy-based weighting method

$$P_{ij} = \frac{x_{ij}}{\sum_{j=1}^n x_{ij}}, \quad E_i = -\frac{\sum_{j=1}^n P_{ij} \cdot \ln P_{ij}}{\ln n}$$

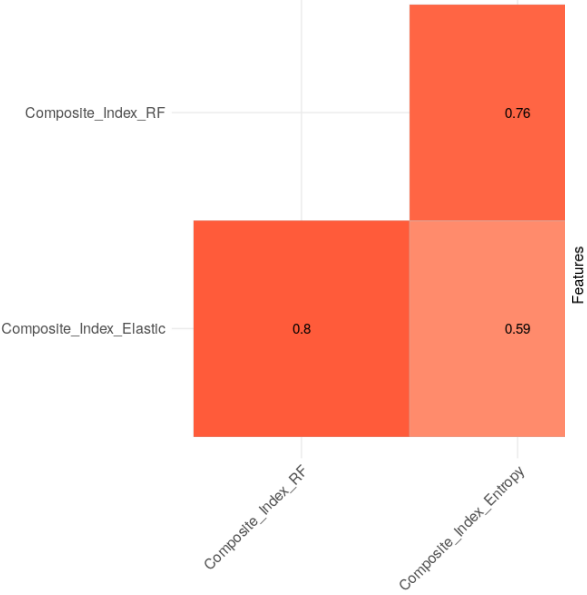
$$w_i = \frac{1 - E_i}{\sum_{i=1}^m (1 - E_i)}$$

The model development followed a structured pipeline:

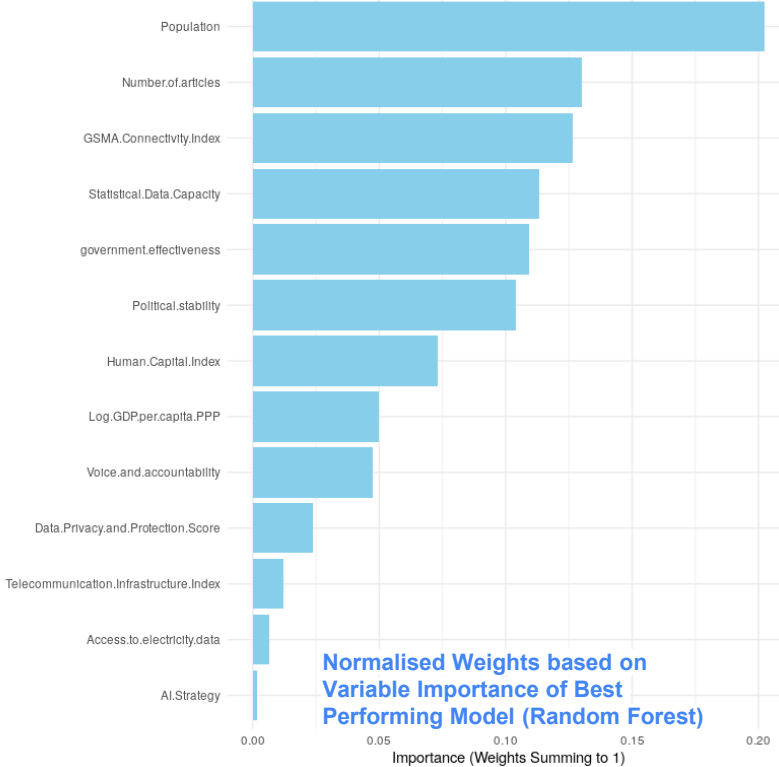
- **Dataset Splitting:** The dataset was divided into training (80%) and testing (20%) subsets to ensure generalizability.
- **Hyperparameter Tuning**
- **Cross-Validation:** Five-fold cross-validation was applied to enhance parameter estimation and mitigate overfitting, ensuring a robust and reliable modeling process.

# Methodology

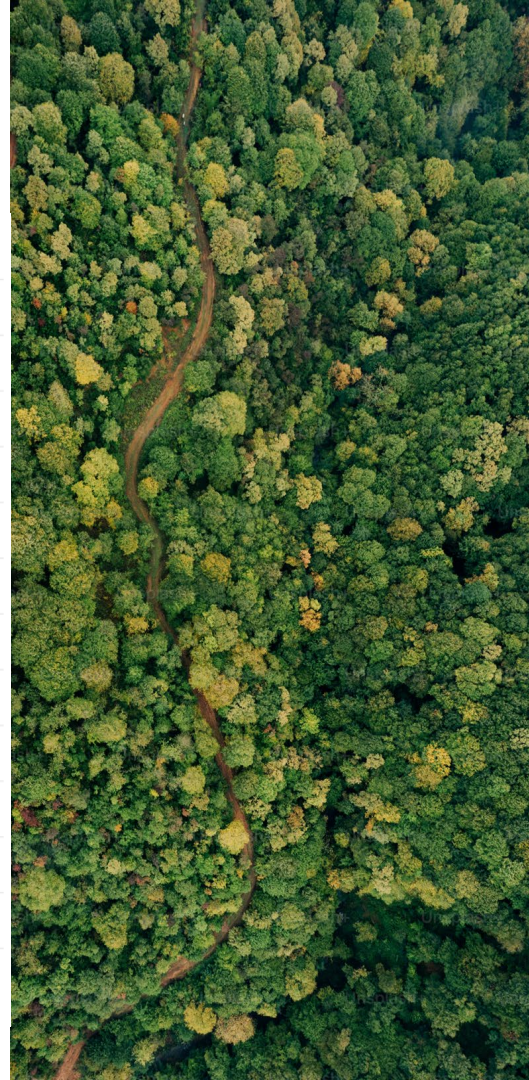
Correlation Matrix of Composite Indices



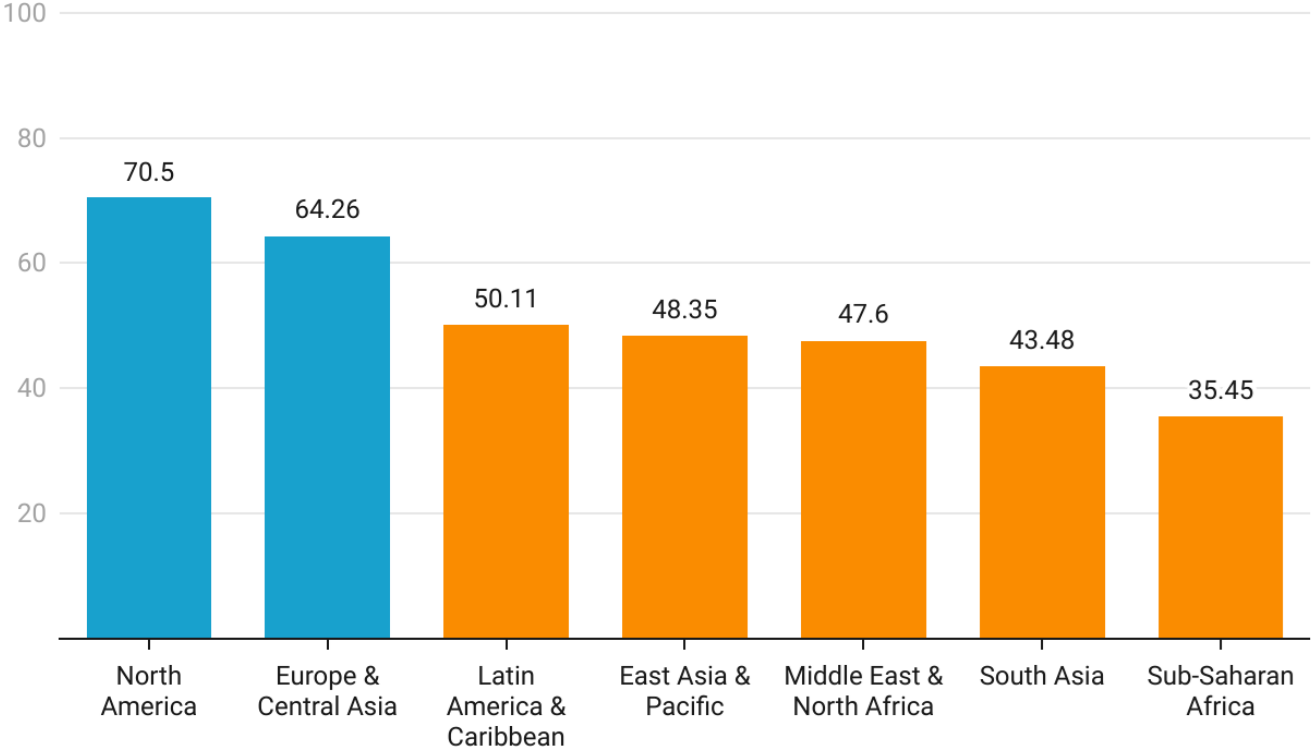
Variable Importance Weights (Random Forest)



Normalised Weights based on Variable Importance of Best Performing Model (Random Forest)



# Global Insights – Investment Potential Across Continent

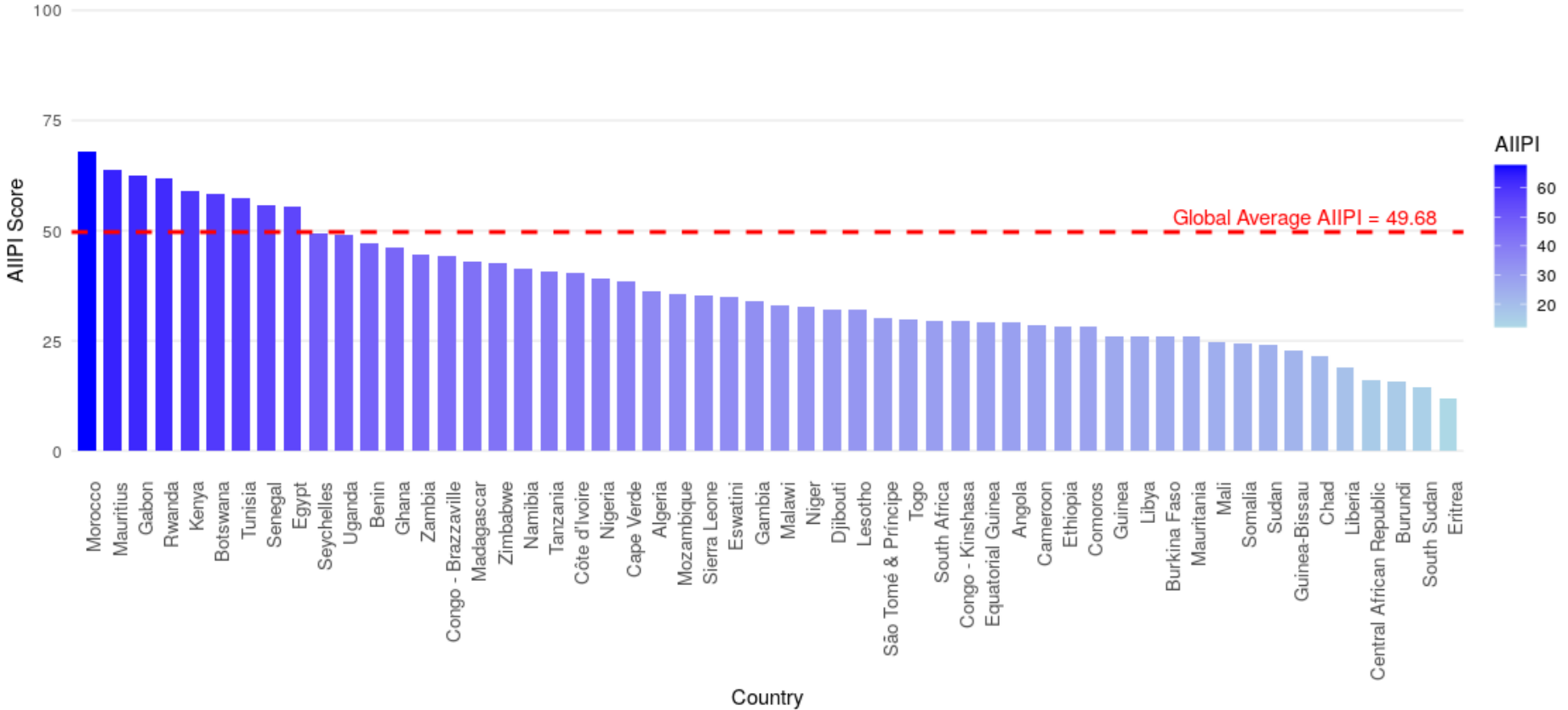


*The colors correspond to the investment potential stage, where Stage 2 is Orange and Stage 3 in Blue.*



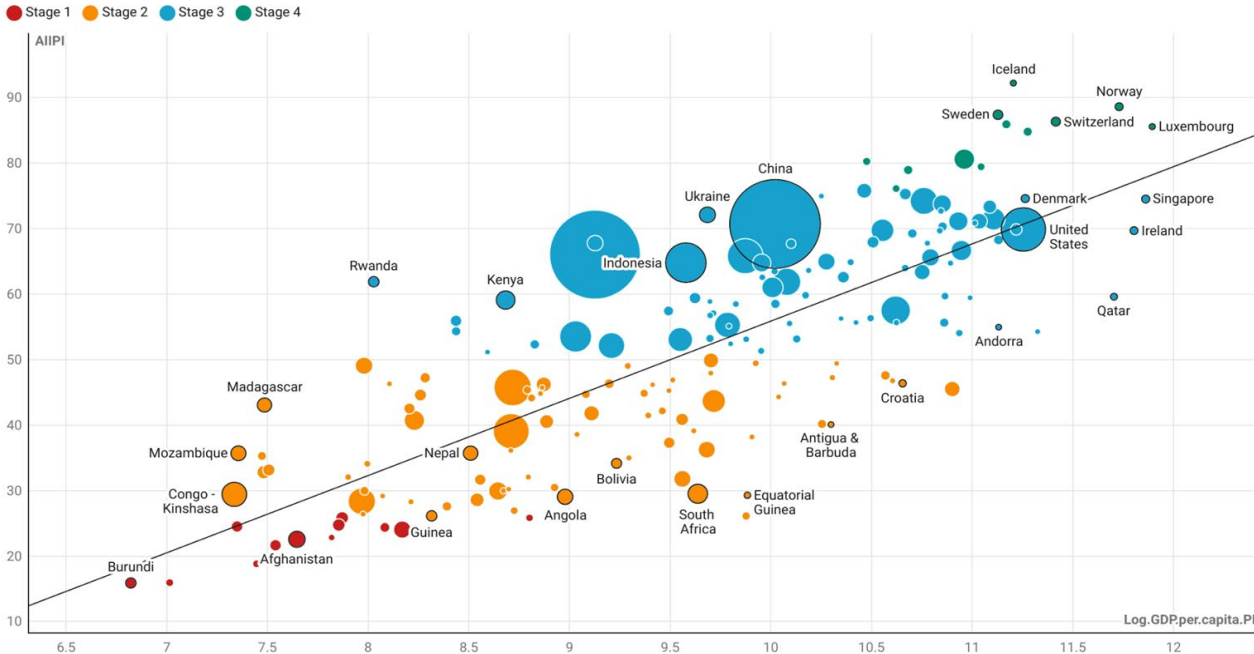


# AI Investment Potential Index by Country in Africa



# The Interplay of Economic Wealth and AI Investment Potential

**Strong positive correlation : wealthier nations have a greater capacity to attract and utilize AI investments effectively.**



- Notable outliers : Singapore and Iceland
- Systemic challenges cause lag in AI adoption capabilities.

# Synergistic Drivers of AI Investment Potential

- **Effective governance** and **robust connectivity infrastructure** are not only essential but also interdependent drivers of AI investment potential.
- Nations with greater AI development (Stages 3 and 4) exhibit both strong governance and high connectivity scores.
- An integrated approach that **strengthens institutional quality**, expands **communication networks**, and **improves data capabilities** is crucial for enhancing AI investment potential.
- Prioritizing these foundational areas can significantly amplify AI readiness, particularly for countries with weak governance and limited connectivity.

# Policy Implications and Recommendations

**For MDBs or DFIs: prioritize investments in components of the AI-IPI with the strongest effect to increase future investments.**

- **Infrastructure Development:** Expand high-speed internet access, reliable electricity grids, and digital infrastructure to support AI adoption.
- **Government Policy:** Encourage national AI strategies, including ethical guidelines, regulatory frameworks, incentives for private sector participation, as well as data privacy and open data initiatives.
- **Skills Development:** Promote AI education and training programs to build a skilled workforce capable of leveraging AI technologies.
- **International Collaboration:** Foster partnerships between governments, international organizations, and the private sector to share best practices and resources.

## Further research

- **Timelags:** the lag between investment in AI-IPI components and actual AI investments in the country.
- **Time-varying or stage-varying coefficients:** the components of the AI-IPI may vary in importance over time, depending on the AI stage of development.
- **Impact of AI on TFP and growth:** so far limited literature on the topic but important to assess AI's impact on productivity, growth and jobs.

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