

The Role of National Political Stability in Driving AI Readiness in Algeria

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Abstract

The AI Readiness index starts to be considered a good indicator for assessing national digital transformation levels, as it reflects the efforts made by governments toward digital transformation and development. It also serves as a strategic tool that enables policymakers to identify gaps and take appropriate corrective actions, thereby enhancing competitiveness in a highly competitive global environment, where countries lagging in AI adoption face structural challenges and pressures from leading nations, further widening the digital divide. This study constructs an AI Readiness Index for Algeria, taking into account the African context, and examines its relationship with political stability over the period 2015–2023. During this period, Algeria recorded a notable improvement in political stability, accompanied by good institutional

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resilience. The results show a strong and significant positive relationship between political stability and AI readiness, while Granger causality tests confirm that gains in stability precede and contribute to improvements in readiness. The findings suggest that developing countries should prioritize enhancing political stability alongside other enabling factors to ensure increasing AI readiness and accelerate digital transformation.

Keywords: Artificial Intelligence Readiness, Political Stability, Digital Transformation, Sustainable Development, Algeria , Granger Causality, AI Policy.

1. Background

Artificial Intelligence (AI) is reshaping economies across the globe, driving innovation while simultaneously raising challenges related to skills, institutional capacity, and socio-political adaptation. While leading nations are harnessing AI to boost productivity, institutional efficiency, and resilience, countries that lag behind risk deepening their technological dependence and widening existing development gaps.

In this context, AI readiness has emerged as a strategic policy tool, allowing governments to evaluate their preparedness for AI adoption, at the same time helping policymakers to identify structural gaps, implement corrective measures, and enhance competitiveness in an increasingly globalized environment, however, AI readiness remains an underexplored field of study in Algeria, particularly in relation to political and institutional factors. Among these, political stability stands out as a critical enabler of digital transformation. A stable political environment reduces uncertainty, attracts investment, and provides the foundation for long-term strategies necessary to strengthen AI readiness.

This study addresses this gap by developing an AI Readiness Index for Algeria, adapted from the framework of ([Baguma, et al. 2022](#)), and examining its relationship with political stability. Using

correlation analysis and Granger causality tests, the research seeks to answer the central question:

Does political stability in Algeria contribute to improvements in AI readiness?

Based on this objective, we propose the following hypotheses:

- H1. Political stability in Algeria is positively correlated with AI readiness.
- H2. Political stability in Algeria Granger-causes advances in AI readiness.

The Objective of the study:

The purpose of this research is to construct an AI Readiness Index for Algeria, adapted to the socio-economic realities of African countries, and to subsequently examine its relationship with political stability during the period 2015–2023. More specifically, the study investigates whether improvements in political stability are not only correlated with but also causally linked to advances in Algeria's institutional and technological preparedness for AI adoption.

The importance of the study:

The significance of this study can be summarized as follow ;

- First, it fills a critical gap in the measurement of AI readiness by constructing an index tailored to Algeria, reflecting the socio-economic and political realities of African countries often overlooked in global indices.
- Second, it advances the literature by empirically examining the underexplored link between political stability and AI readiness, demonstrating that stability is not only a foundation but also a driver of institutional and technological preparedness for AI adoption.
- Third, by applying correlation and causality analysis, the study generates practical insights for policymakers: effective AI strategies must be coupled with efforts to enhance political stability in order to accelerate digital transformation, attract investment, and promote sustainable development. In doing so, the Algerian case offers lessons of broader relevance for emerging economies facing similar challenges..

Methodology:

The study adopts a quantitative, time-series-based design to assess Algeria's AI readiness and its interaction with political stability over the period 2015–2023. A context-sensitive AI Readiness Index was developed following ([Baguma, et al. 2022](#)) framework , with modifications to capture the socio-economic and institutional specificities of African countries. The index integrates four key dimensions—infrastructure, human capital, innovation, and institutional capacity—to provide a comprehensive measure of Algeria's preparedness for AI adoption. Political stability was measured using the ([Worldwide Governance Indicators 2025](#)), with emphasis on the Political Stability and Absence of Violence/Terrorism indicator.

The empirical analysis was conducted in two stages. First, correlation tests were employed to establish the strength and significance of the association between political stability and AI readiness. Second, Granger causality analysis was applied to test the directionality of influence, preceded by stationarity diagnostics to ensure methodological rigor. Statistical outputs were systematically compiled into tables to support clear interpretation, offering a solid evidence base for both academic inquiry and policy formulation.

1. Overview on AI readiness

AI readiness is a multidimensional concept used to evaluate the level of preparedness of governments, organizations, sectors, and individuals to adopt, implement, and benefit from artificial intelligence technologies (Naheed, Pinto and Pirola 2025). It measure the extent to which an entity is equipped to successfully adopt and leverage AI technologies. Key dimensions include (Thakur 2025):

Table 1: Dimensions of AI Readiness Assessment

Dimension	Description
Technological/infrastructural readiness	Availability and quality of digital and AI-specific infrastructure
Human capital and skills	Workforce competencies, education, and training in AI
Data and information readiness	Access to quality data and data management capabilities
Organizational/strategic alignment	Leadership vision, strategy, and governance structures.
Ethics and governance	Regulatory frameworks, ethical guidelines
Environmental and external factors	Market conditions, policy environment, and societal attitudes

1.1. Governmental AI readiness

Governmental AI readiness is often assessed at the national level using composite indices. It combine quantitative and qualitative data, often using weighted scoring and benchmarking. Key similarities include focus on infrastructure, human capital, and governance; differences arise in indicator selection and weighting to reflect local priorities ([Baguma, et al. 2022](#)), ([Pramanik, Jana and Ghosh 2024](#)). Major frameworks include:

- **Oxford Insights Government AI Readiness Index:** Measures countries on dimensions such as government strategy, data and infrastructure, technology sector, human capital, and ethics. Data sources include public policy documents, international datasets (e.g., World Bank, UN), and expert assessments. Calculation typically involves normalization and aggregation of indicator scores ([Insights 2024](#)).
- **Global AI Index (Tortoise Media):** Focuses on innovation, investment, implementation, and infrastructure, using data from patents, research output, startup activity, and education statistics ([Mostrous, Cesareo and White 2024](#)).

While global indices provide a valuable foundation, their applicability varies significantly across different regional and socio-economic contexts, particularly in Africa, prompting calls for context-specific frameworks.

- **Custom regional indices:** For example, ([Baguma, et al. 2022](#)) proposed the African AI Readiness Index, which adapts global frameworks to the regional context by emphasizing national AI vision, governance, digital infrastructure, R&D capacity, and employment in AI-related roles. Despite its relevance, implementing this index can be challenging due to the limited availability of comprehensive data across all dimensions.

1.2. AI Readiness Index for Algeria

Although numerous global AI readiness indices exist, only a limited number of studies have focused specifically on the African context. Among these, ([Baguma, et al. 2022](#)) stands out as one of the few to propose a comprehensive framework tailored to the continent's unique socio-economic and infrastructural realities. Drawing on a systematic literature review, the study emphasized the importance of context-sensitive indicators and frameworks that reflect the specific challenges and opportunities faced by African

nations, contrasting with many global indices that are often criticized for their lack of regional relevance. It integrates several Africa-specific dimensions, including: Vision, Governance and Ethics, Digital Capacity, Technology Sector Size, Research and Development, Education, Infrastructure, Data Availability, Employment, and GDP (PPP-adjusted). This approach highlights the necessity of adapting AI readiness assessment tools to local contexts, ensuring that indicators capture both the opportunities and constraints unique to African nations, rather than relying solely on global frameworks that may overlook these nuances.

2. METHODOLOGY

2.1. The AI index for Algeria

Our study builds on the conceptual framework proposed by [\(Baguma, et al. 2022\)](#) for assessing AI readiness in Algeria. In this research, we adapt the framework using 15 measurable indicators across eight dimensions, based on data availability.

2.1.1. Data collection and Variables selection

The selected variables are :

Table 2:Dimensions, Variables, and Data Sources

Dimensi on	Variables (Indicators)	Source
Vision	- National AI Strategy; - Data Protection Laws	Custom research
Digital Capacity	- Internet Users (% of population); - Fixed Broadband Subscriptions (per 100 inhabitants)	World Bank World Bank
Infrastructu re	- Electricity Access (% of population); - Mobile 3G/4G Coverage (% of population)	World Bank ITU DataHub
Technology Sector	ICT Service Exports (% of total service exports)	World Bank
Research & Developmen t	- Patents (resident applications per million inhabitants); - Total Patent Applications; - Number of Publications in Technology fields; - H-index in Technology fields	WIPO IP Statistics WIPO IP Statistics Scimago Ranking Scimago Ranking
Educatio n	Number of Universities with AI Programs	EduRank
Data Environme nt	Open Data Index Score	Open Data Watch : ODIN
Economi c & Employmen t	- GDP per Capita (PPP, USD); - Employment in Services (% of total employment)	World Bank World Bank

Source : Authors' compilation based on data availability.

The study period spans 2015 to 2023. This timeframe was selected because the global rise of artificial intelligence as a strategic priority began in the mid-2010s, with a clear emergence in Africa after 2018, when many African countries initiated efforts to establish data infrastructures, regulatory frameworks, and educational programs to support AI development (Gwagwa, et al. 2020). The cut-off point of 2023 was chosen as most publicly available datasets, particularly from the World Bank ([World Bank 2024](#)), ITU ([International Telecommunication Union \(ITU\) 2023](#)), WIPO ([World Intellectual Property Organization \(WIPO\) 2024](#)), and ([SCImago 2023](#)), are updated only up to that year. By focusing on this period, we capture the formative years of AI adoption and digital transformation in Algeria, allowing us to assess the readiness at a critical stage of technological development.

2.1.2. Framework Justification and Adaptation

While our framework is based on ([Baguma, et al. 2022](#)) results , several adjustments were implemented due to data availability constraints in the target countries. For instance, original dimensions such as *STEM graduates*, *R&D expenditure*, *ICT workforce size*, and *startups* could not be consistently measured for the selected period, or even data for example about startups doesn't show the number of succeed startup which may overestimate the effect of that variable in index computation . Instead, we adopted

Employment in Services (% of total employment) as a proxy for labor market orientation toward knowledge-intensive sectors, and the *number of universities with AI programs* as a proxy for AI-related educational capacity. These modifications ensure that the framework remains empirically operational while still capturing the essential aspects of AI readiness. Importantly, the chosen indicators maintain the conceptual integrity of the original model, reflecting Algeria's digital capacity, research ecosystems, institutional readiness, and broader economic foundations for AI adoption.

2.1.3. Data Processing and Normalization

The construction of the AI Readiness Index followed a structured multi-step approach. Data for Algeria were compiled for the period 2015–2023, covering the previous key dimensions: Vision, Digital Capacity, Infrastructure, Technology Sector, Research and Development, Education, Data Environment, and Economic and Employment. To account for differences in measurement units and scales across indicators using both simple and pure Min–Max scaling (rescaling values into the [0,1] interval),

2.1.4. The AI index for Algeria

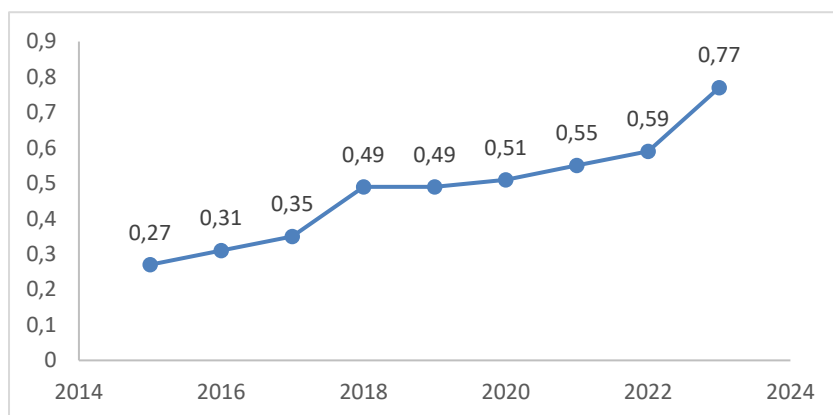
Normalized indicators were first aggregated within each dimension, and subsequently averaged across dimensions to obtain the overall AI Readiness Index as follow:

Table 3: AI Readiness Index in Algeria (2015–2023)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Ai index	0.27	0.31	0.35	0.49	0.49	0.51	0.55	0.59	0.77

Source: Compiled and processed by the authors using Python.

Figure 1: AI Readiness Index in Algeria (2015–2023)



Source: Created by the author using MS Excel.

The AI Readiness Index in Algeria shows a clear steady upward trajectory, rising from 0.27 in 2015 to 0.77 in 2023. This evolution shows gradual progress in digital capacity, infrastructure, and institutional preparedness. While growth during the 2015–2019 period was moderate, the sharp acceleration observed after 2020 highlights a turning point in Algeria’s digital transformation agenda. This momentum coincides with government-led reforms and initiatives ; such as the promotion of start-ups , fiscal incentives to stimulate innovation, and targeted investments in

digital infrastructure.

From an economic standpoint, the post-2020 surge signals a transition from fragmented, isolated initiatives toward a more coherent and structured policy framework designed to foster technological adoption, strengthen innovation ecosystems, and position AI as a lever for sustainable development.

It is important to note, however, that this index is specifically tailored to Algeria's context and therefore cannot be directly compared to international indices; rather, it serves as a context-sensitive tool to capture domestic progress and policy effectiveness for Algeria only.

2.2. Political Stability indicator

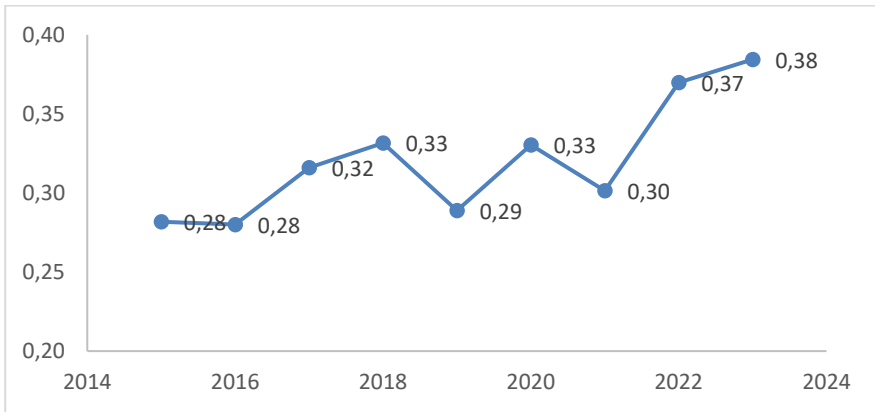
Political Stability (PS) , as measured by the ([Worldwide Governance Indicators 2025](#)), estimates the perception of the likelihood that a government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence or any act of terrorism. It reflects in such a way the degree of security, predictability, and resilience in the political environment of a country.

Table 4: Normalized Political Stability indicator (2015–2023)

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
PS Indicator	0.28	0.28	0.32	0.33	0.29	0.33	0.30	0.37	0.38

Source: Created by the author normalizing data from ([Worldwide](#)

Figure 2: Normalized Political Stability indicator (PS) for Algeria (2015–2023)



Source: Created by the author using MS Excel.

2.3. Relationship between Political Stability and AI Readiness

Statistically examining the relationship between Algeria's Political Stability indicator (PS) and its developed AI Readiness Index (ARI) provides the strength and significance of their association. Subsequent causality tests help identify the direction of influence and validate the relationship.

2.3.1. Correlation analysis

We used Pearson's correlation since the variables are quantitative and continuous. The results are as follow:

Table 5: Pearson Correlation between PS and ARI (2015–2023)

Measure	Value	Test Statistic	df	t-table	p-value	α (Significance Level)
Pearson Correlation	0.824	$t = 3.85$	7	2.365	0.0064	0.05

Source: Created by the author using Python.

Table 5 shows a strong and statistically significant positive correlation ($r = 0.824$, $t = 3.85 > t_{0.05,7} = 2.365$, $p = 0.0064 < \alpha = 0.05$) between Algeria’s AI Readiness Index (ARI) and Political Stability (PS). This indicates that improvements in AI readiness are closely associated with higher levels of political stability, *confirming our hypothesis N°1*

From an economic and governance perspective, this finding highlights a close association between political stability and AI readiness. A stable political environment often coincides with stronger capacity for investment in AI infrastructure, human capital development, and institutional capability. In parallel, higher AI readiness is typically aligned with conditions of reduced uncertainty, greater institutional trust, and governments’ ability to implement long-term digital strategies. The relationship therefore reflects the intertwined nature of governance quality and technological preparedness in Algeria.

While this analysis is based on correlation, the direction of influence between the two variables requires further testing. This can be explored through a causality analysis (Granger causality), as follow:

2.3.2. Granger Causality

We applied the Granger causality tests to examine the directional influence that may exist between PS and ARI . We used lagged differences to ensure stationarity and improve the robustness of the causality results, Since some variables were non-stationary initially. The findings are summarized in Table 6.

Table 6:Granger Causality Results ARI vs PS

Direction	Lags	Test Type	Statistic	p-value	df (num, denom)	Result
AIR → PS	1	Chi-square	$\chi^2 = 2.5834$	0.1080	(1)	Not significant
		Likelihood Ratio	$\chi^2 = 2.2388$	0.1346	(1)	Not significant
	2	Chi-square	$\chi^2 = 3.8765$	0.1440	(2)	Not significant
		Likelihood Ratio	$\chi^2 = 3.0849$	0.2139	(2)	Not significant
PS → AIR	1	Chi-square	$\chi^2 = 6.9633$	0.0083	(1)	Significant
		Likelihood Ratio	$\chi^2 = 5.0093$	0.0252	(1)	Significant
	2	Chi-square	$\chi^2 = 25.7336$	0.0000	(2)	Significant
		Likelihood Ratio	$\chi^2 = 10.7974$	0.0045	(2)	Significant

Source: Created by the author using Python.

Table 6 shows that when testing the hypothesis “AI readiness (AI) causes political stability (PS)”, none of the Chi-square or Likelihood Ratio tests are statistically significant at either 1 or 2

lags (all p-values > 0.10). This means there is no evidence that improvements in AI readiness Granger-cause political stability in Algeria during the study period.

In contrast, the reverse hypothesis “Political stability (PS) causes AI readiness (AI)” is consistently supported by the results. At lag 1, both the Chi-square ($\chi^2 = 6.9633, p = 0.0083$) and Likelihood Ratio ($\chi^2 = 5.0093, p = 0.0252$) tests are significant at the 5% level, suggesting a short-term causal effect. At lag 2, the Chi-square ($\chi^2 = 25.7336, p = 0.0000$) and Likelihood Ratio ($\chi^2 = 10.7974, p = 0.0045$) tests remain highly significant, reinforcing the robustness of this direction of causality even with longer lags, *confirming our hypothesis N°2*

Thus, statistically, there is unidirectional causality from the first variable : political stability to the second one : AI readiness, but not vice versa. This result implies clearly that *political stability* is an important condition in improving *AI readiness* in Algeria; ie :A stable political environment reduces uncertainty, encourages domestic and foreign investment, and enables governments to implement consistent digital policies and strategies. Such stability facilitates the allocation of resources to AI infrastructure, supports human capital development, and strengthens institutional capacity.

On the other hand, while AI readiness may enhance efficiency and transparency in the long term, the current evidence suggests it has somehow not yet reached a level where it can significantly influence Algeria's political stability. This highlights the importance of governance reforms and conflict risk mitigation as foundational steps toward leveraging AI for sustainable development.

CONCLUSION

Artificial Intelligence (AI) represents a strategic opportunity for Algeria to diversify its economy and accelerate digital transformation. However, its adoption in Algeria still at its early stage, and despite government efforts to promote its use, hidden variables such as *political stability* play a crucial role in shaping the effectiveness of these initiatives.

This study developed an Ai readiness index (ARI) for Algeria and studied in details the interplay between political stability and AI readiness in Algeria during the period; 2015 to 2023. The starting point is based on an adapted AI readiness framework tailored to the African context. The findings reveal a strong and statistically significant positive correlation between political stability and AI readiness. The Granger causality test indicates that improvements in stability precede gains in AI preparedness. In contrast, the reverse causality appears weaker on not meaningful at this period , reinforcing the view that political stability is a key driver rather than an outcome of technological readiness.

Another insight is that AI readiness in Algeria began to show marked improvement after 2020 (After Hirak period) , supported by initiatives such as Ministerial Decree No. 1257 – “One Degree, One Start-up / One Degree, One Patent”, fiscal incentives, and

expanding tech incubators. This decree encourages innovation by transforming university projects into start-ups and patents, reinforcing the ecosystem for AI-driven growth. This reflects government efforts to strengthen digital infrastructure, promote innovation, and align national strategies with international transformations in the digital economy. These advances signal Algeria's intention to catch up with global trends, while also highlighting the structural need for institutional stability to sustain this trajectory.

Economically and institutionally, the results suggest that political stability creates the conditions for sustained investment in AI infrastructure, human capital, and innovation ecosystems. By reducing uncertainty and strengthening trust, stability enables the formulation and implementation of long-term strategies necessary for digital transformation. In this regard, Algeria's path toward AI readiness depends not only on technological inputs but also on its ability to maintain a stable and predictable institutional environment.

The contribution of this research lies in repositioning political stability as a foundational enabler of AI-driven digital transformation, a perspective often overlooked in global indices. For policymakers, the evidence underscores the importance of coupling AI adoption strategies with efforts to reinforce

institutional stability, ensuring that digital transformation is resilient, inclusive, and sustainable.

Nonetheless, the study is subject to limitations, including its reliance on secondary data and the relatively short timeframe analyzed. Future research could expand the scope by integrating additional socio-economic and institutional dimensions, exploring sectoral applications of AI readiness, and conducting comparative analyses across African economies. Such work would deepen understanding of how stability interacts with technological preparedness to shape long-term digital change in the region.

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