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POLICY REPORT

AI Readiness in Sub-Saharan African Governments: Socio-Economic and Institutional Drivers

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"The world we have made, as a result of thinking we have done thus far, creates problems we cannot solve at the same level of thinking at which we created them." –Albert Einstein

Introduction

Africa is home to some of the world's oldest traditions and vibrant cultures. However, the lingering effects of colonialism along with African leaders' mismanagement continue to shape its socio-economic landscape, influencing its progress toward achieving the Sustainable Development Goals (SDGs) and the widespread adoption of Artificial Intelligence (AI) (Register, 2021; Akpudo et al., 2024). AI, while increasingly prevalent, remains a complex and highly technical concept, often associated with specialized fields of study. From a governmental standpoint, AI is not solely about technological advancements but also it represents a convergence of innovation, policy considerations, and societal impact (Iuga & Socol, 2024). AI offers transformative opportunities for national economies, particularly within the public sector, where it can be leveraged to enhance efficiency, optimize resource allocation, and improve citizen services (Robles & Mallinson, 2023). AI-powered tools such as predictive analytics, automated decision-making, and real-time data processing enable governments to anticipate citizen needs, improve public service quality, and navigate complex socio-economic uncertainties (Mikhaylov et al., 2018).

Despite AI's potential, its implementation varies significantly across countries, shaped by economic structures, social equity, and institutional stability. Understanding the factors that influence governmental AI readiness is crucial for ensuring that AI technologies contribute to inclusive, sustainable, and effective governance frameworks. AI technologies are set to significantly impact life and business, with countries like Togo, Zambia, and Kenya already utilizing AI for social funds distribution, election integrity, and advancements in agriculture and education (Effoduh et al., 2023; Ade-Ibijola & Okonkwo, 2023). Borokini et al. (2023) explore how AI systems, particularly gendered chatbots in Nigeria, perpetuate harmful stereotypes and reinforce gender inequalities such as Temi, a chatbot from First City Monument Bank, is marketed as a polite, always-available assistant, reflecting subservient roles reminiscent of neocolonialism. Despite limited data, it fills a gap in AI policy research with a unique regional and institutional lens. This study aims to address this research gap by offering an empirical analysis of the socio-economic and institutional dimensions shaping AI readiness in government with the African context.

The remainder of this paper is structured as follows: Section 2 reviews the existing literature and research hypotheses, Section 3 describes the data and methodology, Section 4 presents the results and discussion, and Section 5 concludes and offers policy recommendations.

Section 2. Literature review

2.1 Interaction between governmental AI readiness and Economic Freedom

Neoliberal economic theory finds its roots in the works of Friedrich Hayek and Milton Friedman, with its perceived success establishing it as a dominant ideology in modern economic thought (Mathews & Patrono, 2024). According to neoliberal theory, government intervention in

the economy should be minimal, with its primary role limited to implementing reforms that maximize economic freedom (Friedman, 1962). As Karaba (2016) argues, economic freedom is not merely a policy preference but a core tenet of neoliberal identity.

From a theoretical standpoint, mainstream economic thought, grounded in neoliberal principles, asserts that economic growth and prosperity can be achieved by expanding economic freedom (Gwartney & Lawson, 2003; Tag & Degirmen, 2022; Heritage Foundation, 2024; Mathews & Patrono, 2024). Economic freedom was selected as an independent variable because it is directly tied to individuals' fundamental rights to work and property, and it reflects an environment conducive to growth and innovation. Economic freedom is linked to government policy and governance structures, where decisions influence individual self-rule, as well as personal and national prosperity, which are critical for technological advancement, including AI adoption in governance (Kocak & Caliskan, 2023).

A supportive economic environment is essential for the successful adoption of AI in government. Countries with higher levels of economic freedom often find it easier to integrate AI technologies, highlighting the importance of stable and forward-looking economic policies. Therefore, the Economic Freedom Index (EFI), developed by the Heritage Foundation, is a widely used measure that assesses economic conditions across nations. It evaluates dimensions such as the rule of law, government size, regulatory efficiency, and open markets—factors that collectively influence a country's capacity to foster innovation and drive AI development (Heritage Foundation, 2024; Oxford Insights, 2024). Nations with higher economic freedom scores tend to exhibit stronger institutional frameworks, more stable financial systems, and environments that are conducive to both domestic and foreign investment to enhance their attractiveness as hubs for innovation and technology deployment (Iuga & Socol, 2024, p. 273). This economic stability facilitates the allocation of capital and expertise necessary for AI-driven initiatives in the public sector.

Furthermore, economies characterized by minimal regulatory restrictions and open-market policies tend to encourage technological entrepreneurship, AI start-ups, and research collaborations, ultimately accelerating AI adoption at the governmental level (World Economic Forum, 2024). Nations scoring higher on the EFI typically present a conducive environment for AI adoption, characterized by lower taxes, fewer regulations, and better property rights protection (Iuga & Socol, 2024). Moreover, countries with greater economic freedom usually have dynamic, competitive markets, sparking innovation and advanced AI technologies (Ciftci & Durusu-Ciftci, 2022). Given these considerations, we formulated the first hypothesis as follow:

H_1: Higher economic freedom is positively associated with greater governmental AI readiness.

2.2 Interaction between governmental AI readiness and Gender Gap

The role of gender equality in governmental AI readiness has been increasingly recognized in recent literature, particularly in relation to STEM education, workforce participation, and leadership representation (UN Women, 2023; Kumar & Choudhury, 2022). These factors significantly influence a country's ability to develop, adopt, and regulate AI technologies effectively (World Economic Forum, 2024). Gabriela I. Ramos Patiño, Assistant Director-General for the Social and Human Sciences at UNESCO, emphasizes the consequences of these imbalances, stating that: *"... the uneven distribution of power and leadership in the AI sector is very concerning, as are gender biases in datasets and coded AI algorithm products"*

(World Economic Forum, 2022, para. 9). According to the World Economic Forum (2024), Sub-Saharan Africa ranks sixth globally in gender parity (ahead of only Southern Asia and the Middle East/North Africa), with an overall score of 68.4%, marking an improvement of +5.6 percentage points since 2006. While the region has seen increased labor-force participation and higher representation in technical and professional roles, reflected in a score of 68.1%, challenges remain, particularly in education and leadership representation. In Sub-Saharan Africa, the educational attainment remains the most significant barrier, with a score of 88.9%, underscoring the persistent gender gap in STEM education and skill development (World Economic Forum, 2024). Women's underrepresentation in AI governance hampers inclusive policy development, prompting the formulation of our second hypothesis on gender disparities.

H_2: Greater gender equality is positively associated with governmental AI readiness.

2.3 Interaction between governmental AI readiness and Brain Drain

One of the major challenges that low-income countries face in developing human resources is human flight/brain drain which is the tendency for highly talented individuals to pursue education and subsequently migrate to high-income countries. This phenomenon results in the loss of skilled professionals, effectively depleting the labor force of the originating country and hindering technological advancements (Mathews & Patrono, 2024, p.183). Human flight and brain drain weakens a country's capacity to sustain and expand expertise in critical fields such as AI. In a globalized economy, brain drain undermines a country's capacity to retain AI talent, build governance frameworks, and attract investment (Czaika & de Haas, 2015). Conflict-driven migration of skilled professionals, often framed as economic choice, reflects deeper instability—collapsing institutions, poor job prospects, and insecurity. These departures widen the global AI divide, weakening public service implementation and innovation in developing nations. Although based on credible sources, data gaps remain due to the evolving nature of government AI adoption and socio-political volatility. Countries that retain AI talent can accelerate research, development, and economic growth (Singh & Krishna, 2018).

Poverty and unemployment are primary push factors, compelling individuals to seek better opportunities abroad (Asiimwe & Musinguzi, 2024). When there is rapid expansion in industry, e-commerce, and business, brain drain often occurs (Matsui & Raymer, 2020). Economic shifts, geopolitical instability, and policy interventions designed to incentivize talent retention may all play roles in moderating this effect (Iuga & Socol 2024, p. 291). Migration patterns in developing countries are significantly influenced by a combination of push and pull factors. Although characterized by diversified beliefs, and conflicting political interests, Akpudo (2024) states "… such a dynamic amongst vulnerable groups may be as a blessing in disguise for a more inclusive AI adoption in Sub-Saharan Africa" (p. 52). The theoretical previous identified literature mentions demographic shift, namely brain drain, which is composed of well-educated masses as a challenge for implementing the AI strategy in Türkiye's case (Can, 2023). Therefore, region-specific analysis may be required to fully assess the extent to which brain drain affects AI readiness in government institutions. Given these considerations, we formulated the third hypothesis as follow:

H_3: Higher brain drain negatively impacts governmental AI readiness.

2.4 Interaction between governmental AI readiness and Positive Peace

Peace, according to Galtung, is not merely the absence of war but rather the capacity to handle conflicts with empathy, nonviolence, and creativity (Galtung 1996). It encompasses the absence of structural and indirect violence, as well as the presence of social justice and sustainable development. Positive Peace is built on societal attitudes that foster stability, cooperation, and inclusivity. As Galtung explains, "positive peace is the integration of human society" (Galtung, 1964, p. 2). Given that Positive Peace fosters social stability, economic prosperity, and effective governance, it is plausible that it also plays a role in AI readiness within governments. Because Positive Peace is a long-term structural factor, it can serve as a predictor of future substantial declines in peace, providing the international community with early warnings and time to act (Institute for Economics & Peace 2024).

In many ways, Positive Peace acts as a facilitator, creating an environment where workers can be more productive, businesses can operate efficiently, entrepreneurs and scientists can innovate, and governments can effectively serve their citizens (Institute for Economics & Peace, 2024). The integration of AI technologies in governance is significantly influenced by the levels of Positive Peace within a society. Peaceful environments foster stronger governance frameworks, institutional trust, and economic resilience, which are essential for the effective implementation of AI (Hisham, 2024). Testing this hypothesis through empirical analysis will provide empirical insights into whether peace-building efforts indirectly contribute to AI governance capabilities. Given these considerations, we formulated the fourth hypothesis as follow:

H_4: Higher positive peace is positively associated with greater governmental AI readiness.

Section 3. The data and methodology

This study utilizes publicly available 2024 cross-national datasets to examine governmental AI readiness and its institutional, economic, and social determinants. GAII serves as the dependent variable, while Economic_Freedom, Global_Gender_Gap, Humanflight_BrainDrain, and Positive_Peace are analyzed as the key independent variables. The dataset covers 42 Sub-Saharan African countries, employing the Heritage Foundation's Index of Economic Freedom as a primary regional clustering framework. The analysis adopts a cross-sectional approach, focusing on 2024 data to provide an empirical assessment of the current state of AI readiness in governance.

The independent variables (Economic Freedom, Global Gender Gap, Positive Peace, and Human Flight & Brain Drain) are indeed indices composed of multiple underlying indicators collected from secondary sources, international reports, expert evaluations, and survey data. Their reliability varies based on data availability, reporting consistency across countries, and measurement techniques. Hence, the accuracy and completeness of these indices are constrained by the comprehensiveness and representativeness of their component data, highlighting the importance of carefully interpreting findings derived from their use in regression analyses. Table 1 presents a detailed overview of the variables and data sources utilized in this study.[1]

[1] Source: Compiled by author from publicly available index data.

Table 1. Overview of the Variables and Data Sources

Category	Variable / SPSS Symbol / Data Source	Definition / Measurement
Outcome Dependent Variable Explained	Gov_AI_Readiness Government Artificial Intelligence Readiness Index (Oxford Insights 2024)	The Index evaluates three key pillars: Government, Technology Sector, and Data & Infrastructure. It assesses progress, identifies existing gaps, and offers actionable insights for policymakers aiming to enhance AI integration in public service delivery. These factors collectively determine a country's AI readiness Score: 0 (low) – 100 (high)
Independent Variable Core Explanatory	Economic_ Freedom Economic Freedom Index (Heritage Foundation, 2024)	The Index evaluates the mix of 12 quantitative and qualitative factors with four key pillars: Rule of Law, Government Size, Regulatory Efficiency and Open Market. The measure of Economic Freedom evaluates the relationship between liberty, free markets, and national progress. The 2024 Index reaffirms the strong positive correlation between economic freedom and socio-economic development globally. These factors collectively determine a country's Economic Freedom Score: 0 (least free) to 100 (most free).
Independent Variable Core Explanatory	Positive_Peace Positive Peace Index (Institute for Economics and Peace 2024)	The Index is a statistically derived measure of the factors that create flourishing societies, which is based on eight Pillars of Positive Peace: Low Levels of Corruption, High Levels of Human Capital, Free Flow of Information, Good Relations with Neighbors, Acceptance of the Rights of Others, Equitable Distribution of Resources, Sound Business Environment, Well-Functioning Government, These factors collectively determine a country's Positive Peace Score: 1 (very high) to 5 (not included)
Independent Variable Core Explanatory	Humanflight_BrainDrain Human Flight& Brain Drain Index (Fund for Peace, 2024)	The measure of the economic impact of human displacement (for economic or political reasons) and Human flight and brain drain score 0 (low) - 10 (high)
Variable Core Explanatory Variable	Global_Gender Global Gender Gap Index (World Economic Forum, 2024)	The index is an annual benchmark assessing gender parity across four pillars: Economic Participation and Opportunity, Educational Attainment, Health and Survival, Political Empowerment. These factors collectively determine a country's Gender Parity Score: 0 (low) to 1 (high)

This study employs five linear regression models estimated using the OLS method (Equations 1–5) to examine the relationships between key indices. IBM SPSS Statistical Software is used for data processing, along with an analysis of correlations and confidence intervals for each hypothesis, as outlined in the literature review.

Model 1: $Gov\_AI\_Readiness_{it}=\beta_0+\beta_1 Economic\_Freedom_{it}+\epsilon_{it}$ (1)
Model 2: $Gov\_AI\_Readiness_{it}=\beta_0+\beta_2 Global\_Gender\_Gap_{it}+\epsilon_{it}$ (2)
Model 3: $Gov\_AI\_Readiness_{it}=\beta_0+\beta_3 Humanflight\_BrainDrain_{it}+\epsilon_{it}$ (3)
Model 4: $Gov_AI_Readiness_{it}=\beta_0+\beta_4$Positive_Peace$+\epsilon_{it}$ (4)
Model 5: $Gov\_AI\_Readiness_{it}=\beta_0+\beta_1 Economic\_Freedom_{it}+\beta_2 Global\_Gender\_Gap_{it}+\beta_3$ Humanflight_BrainDrain$_{it}+\beta_4 Positive_Peace_{it}+\epsilon_{it}$ (5)

The preliminary statistics descriptive analysis of the variables is stated in Table 2.

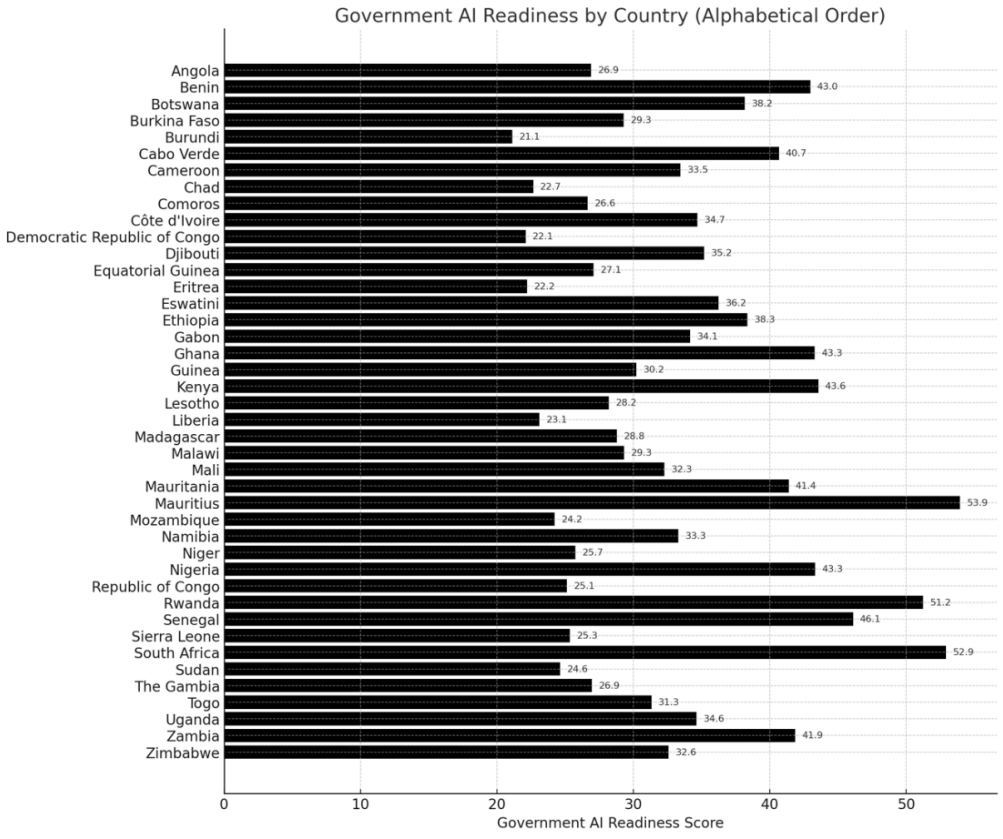
Table 2. Descriptive Statistics[2]

Descriptive Statistics

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Government AI Readiness Index (0–100)	42	32.81	21.13	53.94	1405.30	33.4595	1.35678	8.79294	77.316	.655	.365	-.344	.717
Economic Freedom Index (1–100)	42	37.6	33.9	71.5	2201.4	52.414	1.0884	7.0534	49.750	-.155	.365	1.786	.717
Global Gender Gap Index (0–1)	35	.237	.568	.805	24.214	.69183	.010219	.060457	.004	-.188	.398	-.501	.778
Positive Peace Index (1 high – 5 low)	39	1.65	2.61	4.26	141.00	3.6153	.05789	.36150	.131	-.577	.378	.500	.741
HumanFlight/Brain Drain Index (0–10)	42	5.30	3.40	8.70	258.50	6.1548	.18673	1.21016	1.464	-.233	.365	.206	.717
Valid N (listwise)	33												

Regarding the dependent variable, Sub-Saharan Africa exhibits emerging progress in AI readiness, with Government AI Readiness scores ranging from Burundi (21.13) to Mauritius (53.94). South Africa (52.91) and Rwanda (51.25) also lead the region, reflecting their growing investment in AI capabilities. The mean score of 33.46 and a standard deviation of 8.79 indicate significant disparities among Sub-Saharan African countries. In Figure 1, notably, Mauritius, South Africa, and Rwanda stand out as front-runners, demonstrating clear momentum in strengthening their AI ecosystems (Oxford Insights, 2024).

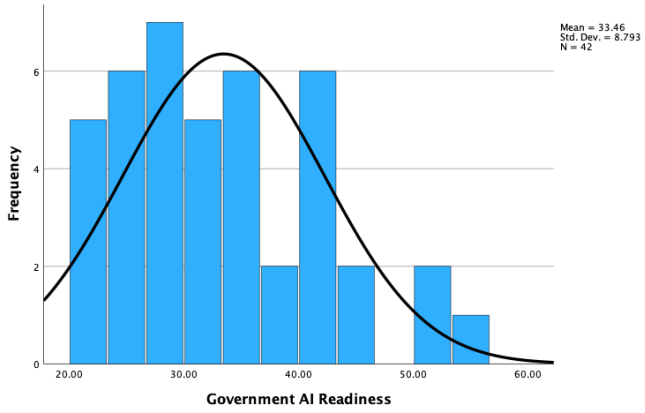
Figure 1. Government AI Readiness by Country in Sub-Saharan Africa Region



[2] Note: The valid N in Table 2 is 33, indicating that some countries have missing data for one or more chosen variables, as "missing values are the devil's work" (Field 2018, 117). This could reduce the statistical power of the regression analysis in the regressions' models. Therefore, data adjustments are necessary to ensure the robustness and accuracy of the modeling process.

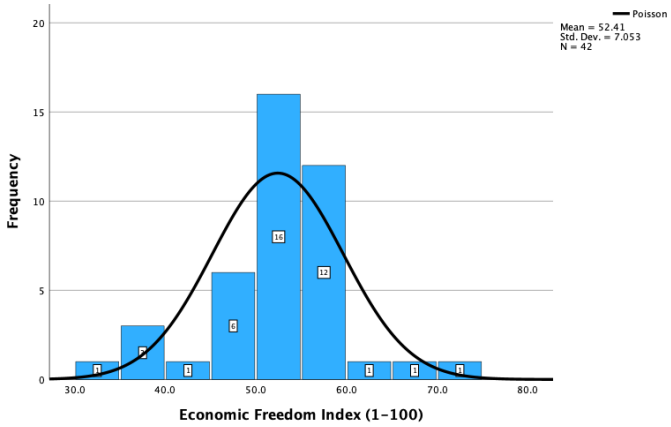
The histogram, shown in Figure 2, exhibits a positively skewed (right-skewed) distribution, which aligns with the skewness value of 0.655 found in the descriptive statistics in Table 2. This suggests more countries in the Sub-Saharan Africa region have lower AI readiness scores, with a few outliers exhibiting much higher readiness. The kurtosis value (-0.344) indicates that the distribution is relatively flat, meaning there are fewer extreme outliers, suggesting a light-tailed distribution close to normal.

Figure 2. The Government AI readiness Histogram



The Economic_Freedom independent variable ranges between Sudan's score (33.9) and Mauritius's score (71.5), with a mean of 52.414 and a standard deviation of 7.0534, indicating moderate variation across countries (Table 2). The skewness (-0.155, slightly negative) suggests a near-symmetrical distribution, meaning that economic freedom scores are balanced without a strong concentration toward lower or higher values. However, the kurtosis (1.786) indicates the presence of some extreme values, suggesting that a few countries have notably higher or lower economic freedom scores compared to the majority. This implies that while most countries fall within a moderate range, a small number of outliers exist with significantly different economic freedom levels as expected (Figure 3).

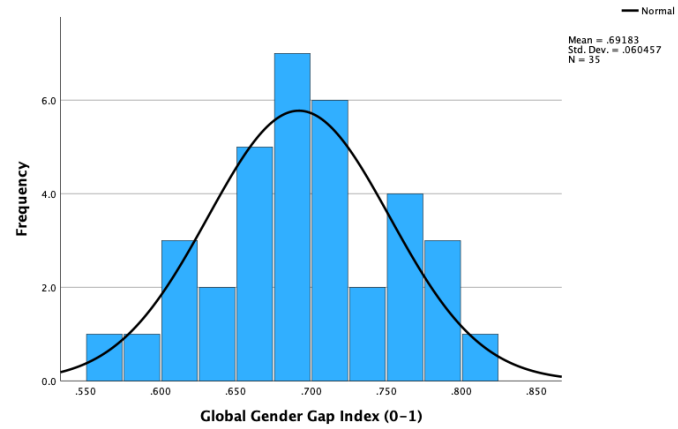
Figure 3. The Economic Freedom Histogram



The Global_Gender_Gap variable in the dataset ranges from 0.568 in Sudan to 0.805 in Namibia, with a mean of 0.69183 and a standard deviation of 0.0651, indicating relatively low variability (Table 2 and Figure 4). The data is approximately normally distributed, with no significant skewness or kurtosis. Slight negative skew (-0.188), but close to symmetric. Kurtosis (-.0.501) indicates a somewhat flatter distribution than normal but within the normal range. The mean Global Gender Gap Index score of 0.69183 (or 69.2%) closely mirrors the regional average parity score of 68.9% reported for Sub-Saharan Africa (World Economic Forum, 2024). This alignment indicates that the sample used in the analysis is broadly representative of the region's overall gender parity landscape.

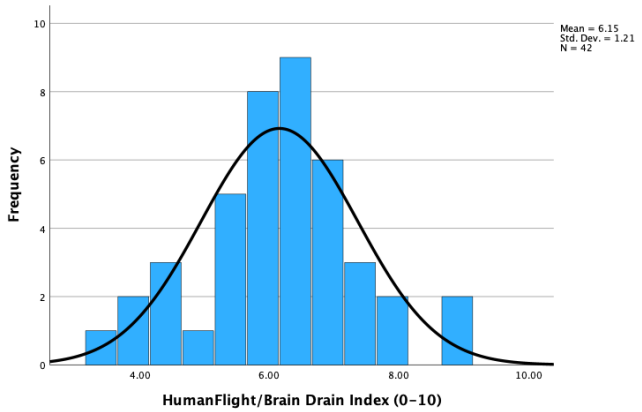
While the average score reflects moderate progress, the range of 0.237 (from 0.568 to 0.805) highlights substantial variation across countries and supporting the observation that gender equality advancement is uneven. Statistically, the low standard deviation (0.060) and near-zero skewness (-0.188) suggest the scores are relatively symmetrically distributed around the mean, but the minimum score of 0.568 shows that some countries are significantly lagging such as Sudan, Chad despite the region's average nearing the 70% closure mark. The fact that over half of countries have closed at least 70% of their gender gap is consistent with the data's mean slightly below that threshold, indicating a cluster just under the 70% mark, with a few strong performers (above 0.70) as over half of Sub-Saharan countries have closed at least 70% of their gender gap, reflecting a moderate but uneven advancement toward gender equality (World Economic Forum, 2024).

Figure 4. The Global Gender Gap Histogram



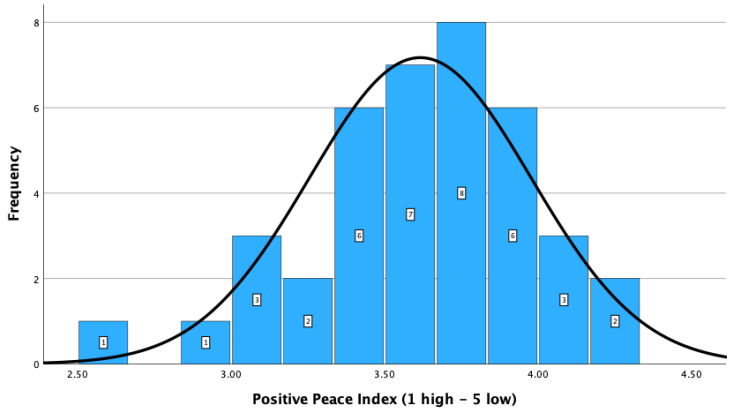
The HumanFlight_Brain Drain independent variable ranges from Equatorial Guinea (3.40) to Eritrea and Eswatini (8.70), with a mean of 6.15 and a standard deviation of 1.21, indicating moderate dispersion across countries. The average brain drain score is relatively high, suggesting that most Sub-Saharan countries in the dataset experience significant human capital flight. The negative skewness score (-0.233) indicates a slight left-skew, meaning that a larger number of countries exhibit higher brain drain levels, while fewer countries experience low levels of human capital flight (Figure 5, Table 2). This pattern highlights the persistent challenge of human flight in the region, which may have implications for AI readiness and broader economic development.

Figure 5. The Human Flight/Brain Drain Histogram



Lastly, the Global_Positive_Peace independent variable ranges from Mauritius's score (2.61) to Chad's score (4.26), with a mean of 3.6153 and a standard deviation of 0.36150, suggesting limited variation across countries. Mauritius, which has the highest EFI score (71.5), also has the lowest GPPI score (2.61), indicating higher peace and stability (Figure 2 and Figure 5). Many countries in this dataset exhibit moderate to greater levels of violence (higher instability), as indicated by their higher GPPI scores. Highly peaceful countries are less frequent, with only a few, such as Mauritius (2.61) and Botswana (2.89), scoring low on GPPI. The findings suggest that Sub-Saharan countries with higher economic freedom tend to experience lower levels of violence and greater stability (Figure 6).

Figure 6. The Global Positive Peace Histogram



Section 4. The results and discussion

The influence of Economic Freedom on Governmental AI readiness is estimated for the analyzed Sub-Saharan countries through the analysis of correlations and confidence intervals, whose outcomes are presented in Table 4. The table presents Pearson correlations, significance levels (p-values), and 95% confidence intervals for relationships between key variables, including Government AI Readiness Index, Economic Freedom Index, Positive Peace Index, Human Flight/Brain Drain Index, and Global Gender Gap Index.

Table 4. Correlation Matrix of Government AI Readiness and its Determinants

Variable	1	2	3	4	5
1. Government AI Readiness	1				
2. Economic Freedom	.499**	1			
3. Global Gender Gap	0.18	0.038	1		
4. Global Positive Peace	-.668**	-.498**	-.397*	1	
5. Human Flight/Brain Drain	-.440*	-.504**	-.644**	.544**	1

*Note: *Correlation is significant at the 0.01 level (2-tailed). Correlation is significant at the 0.05 level (2-tailed). Bootstrapped estimates based on 1000 bootstrap samples.*

Government AI Readiness has a strong positive correlation with Economic Freedom (.499), indicating that higher economic freedom tends to be associated with greater readiness for adopting AI at the governmental level. This relationship is statistically significant at the 0.01 level, suggesting a very reliable association. Economic Freedom shows a strong negative correlation with Global Positive Peace (-.498) and with Human Flight/Brain Drain (-.504), both significant at the 0.01 level. This indicates that higher economic freedom is associated with lower positive peace scores and reduced brain drain.

Global Gender Gap is significantly negatively correlated with Global Positive Peace (-.397, significant at 0.05) and strongly negatively correlated with Human Flight/Brain Drain (-.644, significant at 0.01). Thus, wider gender gaps (higher numerical scores) tend to accompany lower peace and increased brain drain. Lastly, Global Positive Peace has a strong positive correlation with Human Flight/Brain Drain (.544), indicating that less peaceful societies tend to experience higher levels of skilled emigration, which is significant at the 0.01 level. Government AI Readiness is strongly negatively correlated with Global Positive Peace (-.668), meaning that greater AI readiness correlates with lower scores of positive peace (higher positive peace scores indicate less peace). This significant negative correlation suggests that nations more prepared to adopt AI tend to have lower levels of societal peace. Overall, Global Positive Peace appears strongly connected to both societal and economic factors. Countries with lower peace levels tend to experience more gender inequality, higher brain drain, and greater AI readiness, reflecting intricate societal dynamics.

4.1 The influence of the macroeconomic indicators on government AI readiness

Table 5 compares four regression models. Model 3 emerges as the best fit, exhibiting the highest correlation (R^2=0.424) and explaining 42.4% of the variance in the dependent variable. It also has a high adjusted R^2 value (0.408), indicating strong generalizability. Model 1 is significant (p<0.001) but weaker (R^2=0.295). Model 2 performs worst (R=0.206, adjusted R^2=0.013, p= 0.236). Model 4 has high R^2 (0.9) but low adjusted R^2 (0.067), indicating overfitting. Model 3's Durbin-Watson statistic (1.636) suggests moderate autocorrelation, reinforcing its reliability. In contrast, Model 2 lacks predictive power, making it the weakest choice.

The findings indicate statistically significant relationships between Government AI Readiness and key economic and social factors. Firstly, a moderate positive correlation (r = 0.499, p= 0.003) was found between Economic Freedom and Government_AI_Readiness, indicating that countries with higher levels of economic freedom tend to have better AI readiness. This suggests that a strong market economy, reduced regulatory constraints, and open

innovation environments contribute positively to AI development. Previous studies support this relationship, demonstrating that Economic Freedom is significantly associated with a government's ability to implement AI (Ciftci & Durusu-Ciftci, 2022, Le & Kim, 2020).

Table 5. Regression Models

	Model 1	Model 2	Model 3	Model 4
R	0.543	0.206	0.3	0.651
R Square	0.295	0.42	0.9	0.424
Adjusted R Square	0.278	0.013	0.067	0.408
F Change	16.756	1.456	3.955	27.241
t-value	-0.234	0.81	6.822	8.159
Significance of F Change	<0.001***	0.236	0.54	<0.001***
Durbin-Watson	1.45	2.065	1.874	1.636
N	42	35	42	39

In the Sub-Saharan African region, greater economic freedom creates favorable conditions for governments to adopt AI technologies, fostering innovation, digital transformation, and economic growth (Aderibigbe et al., 2023; Ade-Ibijola & Okonkwo, 2023). Furthermore, the PricewaterhouseCoopers (PwC) AI Sizing the Price Report projects that AI technologies could contribute $15.7 trillion (14%) to the global economy by 2030, with $6.6 trillion from increased productivity and $9.1 trillion from consumption-driven growth. For Africa, the financial gains from AI adoption are estimated at $1.2 trillion (Jaldi, 2023). This finding validates H_1 (that higher economic freedom is positively associated with greater governmental AI readiness).

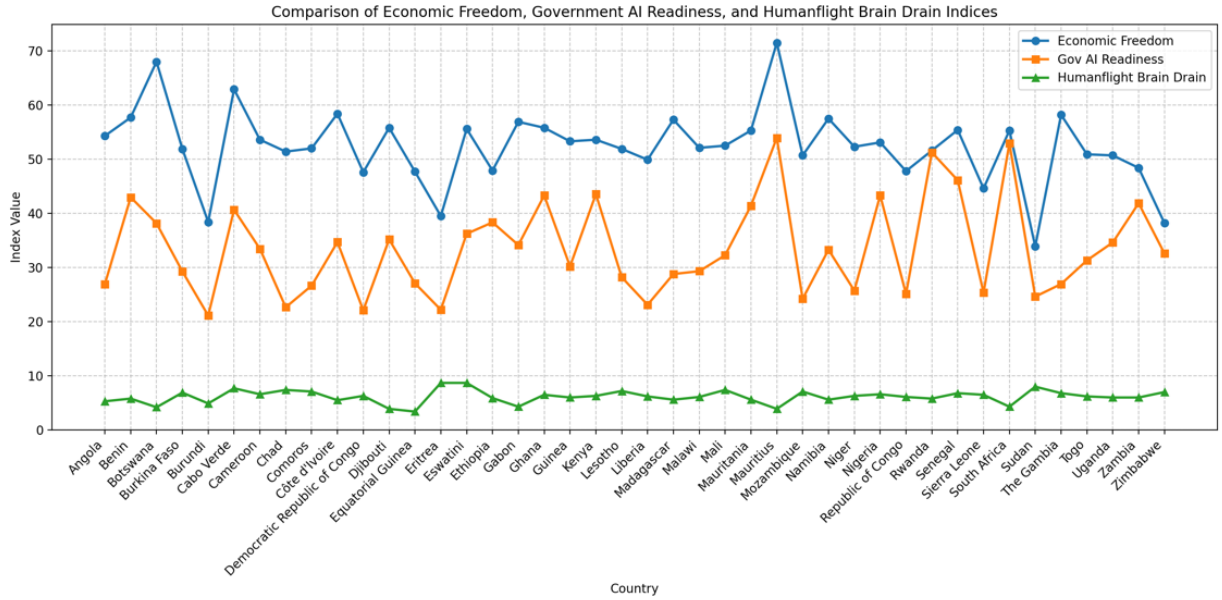
Secondly, a moderate negative correlation (r = -0.440, p = 0.010) was identified between GAII and HFBDI, indicating that countries experiencing higher levels of brain drain tend to have lower AI readiness. This finding supports the argument that retaining skilled professionals is essential for fostering AI capabilities and sustaining a competitive technological edge. It also validates H_3 (i.e., that brain drain negatively impacts AI readiness in government). This result is consistent with existing literature (Czaika & de Haas, 2015; Can, 2023; Iuga & Socol, 2024; Mathews & Patrono, 2024, Agrawal et al., 2019), which emphasizes the detrimental effects of talent migration on technological and economic development.

When comparing GAII, EFI, and HFBDI across Sub-Saharan countries, some nations with high economic freedom, such as Mauritius, also demonstrate high AI readiness. However, data indicates that this trend is not consistent. Mauritius excels in both EFI and GAII while maintaining low brain drain levels. In contrast, Eswatini exhibits a relatively high HFBDI score despite its other indicators, while The Gambia presents the largest disparity between its EFI and GAII scores (Figure 5). These findings highlight the complex and context-dependent relationships between economic policies, talent retention, and AI development in Sub-Saharan Africa.

Thirdly, a strong negative correlation (r = -0.668, $p < 0.001$) was observed between GAII and the GPPI, reinforcing that greater peace and stability (lower GPPI values) are associated

with higher governmental AI readiness levels. This finding validates H_4 (that higher positive peace is positively associated with greater governmental AI readiness).

Figure 5. Comparison of EFI, GAII and HFBDI indices



Lastly, while gender gap is widely recognized as a key driver of economic and technological advancement, the study did not find a statistically significant correlation between the GGPI and GAII ($r = 0.180$, $p = 0.315$), nor between EFI and GGPI ($r = 0.038$, $p = 0.834$). Consequently, this finding fails to reject the null hypothesis that greater gender equality is positively associated with governmental AI readiness, indicating that other economic and institutional factors may play a more dominant role in shaping AI adoption at the national level. This finding suggests that, within this dataset, gender gap does not directly influence AI readiness, though it may have indirect effects that require further investigation using a multiple regression model (Equation 5).

Table 5. Model 5 Coefficients

Model 5 Coeffcients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	78.296	42.431		1.845	.076	-8.620	165.212					
	Economic Freedom Index (1-100)	.181	.266	.145	.679	.503	-.364	.725	.543	.127	.096	.438	2.285
	Global Gender Gap Index (0-1)	-5.493	22.614	-.041	-.243	.810	-51.816	40.831	.206	-.046	-.034	.710	1.408
	Positive Peace Index (1 high - 5 low)	-13.254	5.450	-.545	-2.432	.022	-24.418	-2.090	-.651	-.418	-.343	.397	2.522
	HumanFlight/Brain Drain Index (0-10)	-.422	1.164	-.058	-.362	.720	-2.807	1.963	-.300	-.068	-.051	.775	1.290

a. Dependent Variable: Government AI Readiness Index (0-100)

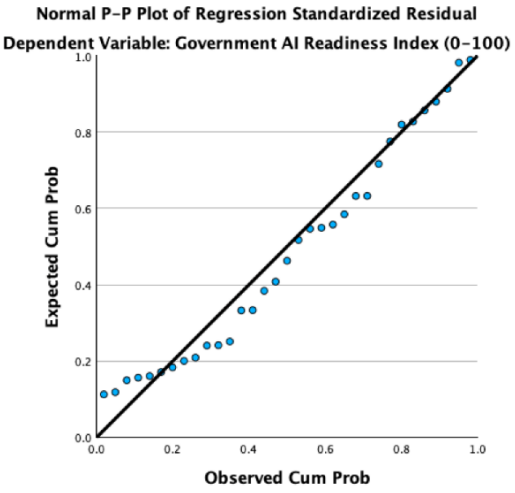
The fifth regression model examines the combined effects of Economic Freedom, Gender Gap, Positive Peace Index, and Brain Drain on Government AI Readiness. Results show that the Positive Peace Index significantly influences AI readiness (p= 0.022, β= -0.545), while Economic Freedom (p= 0.503, β= 0.145), Gender Gap (p= 0.810, β=-0.041), and Brain Drain (p= 0.720, β= -0.058) are not statistically significant. This suggests that political stability plays a more crucial role in AI adoption than economic or social factors.

The strong negative correlation between the Positive Peace Index and AI Readiness suggests that politically stable nations are better positioned for AI adoption. While Economic Freedom was previously correlated with AI readiness (r= 0.499, p= 0.003), its insignificance in regression may stem from overlap with political stability, highlighting governance as a stronger determinant. Though VIF= 2.285 indicates no severe multicollinearity, Economic Freedom shares variance with the Positive Peace Index. Their negative correlation (r= -0.699, p<0.001) suggests that economically freer countries tend to be more politically stable, reinforcing governance's critical role in AI readiness.

In the fifth regression model, multicollinearity may explain why Economic Freedom loses significance, as its effects overlap with the Positive Peace Index. The insignificance of Gender Gap and Brain Drain suggests that while these factors influence long-term technological progress, their immediate impact on AI readiness is limited. The findings highlight the essential role of political stability in AI adoption, indicating that Sub-Saharan governments must prioritize governance reforms, policy stability, and institutional capacity alongside economic and social policies.

The fifth model suggests that AI implementation in Sub-Saharan Africa relies more on governance than economic factors alone. Despite a reduced sample size (N = 33), the regression model meets normality assumptions, ensuring valid statistical inferences. The findings highlight the Global Positive Peace Index as a key determinant of AI readiness, reinforcing the role of political stability and governance quality in AI adoption. While Economic Freedom initially correlated with AI readiness (r = 0.499, p = 0.003), it lost significance in regression (p = 0.503, β = 0.145), suggesting its effects overlap with institutional stability. Future research should explore how governance mediates the impact of Economic Freedom, Gender Gap, and Brain Drain on AI readiness.

Figure 5. P-P Plot of Regression



In Figure 5, the fifth regression model demonstrates normally distributed residuals, ensuring that hypothesis tests (t-tests and confidence intervals) remain valid and reliable. The points in the Normal P-P Plot closely align with the diagonal line, indicating that the residuals follow an approximately normal distribution. This suggests that the normality assumption is satisfied, meaning that the statistical inferences drawn from the regression model, including p-

values and confidence intervals, are trustworthy. These findings highlight the critical role of institutional reforms and governance improvements in enabling AI adoption in Sub-Saharan Africa. While Economic Freedom was initially correlated with Government AI readiness (r = 0.499, p = 0.003), it did not remain significant in the regression model (p = 0.503, β = 0.145). This suggests that Economic Freedom may share some variance with the Positive Peace Index indicating that the stability and effectiveness of institutions may be a stronger determinant of AI readiness than economic neo liberalization alone.

Section 5. Concluding Remarks and Future Research Recommendation

This study examines the impact of economic freedom, gender parity, brain drain, and positive peace on government AI readiness in Sub-Saharan countries, considering distinctive socio-economic determinants. A key question for the region is whether it possesses the necessary technical and socio-economic infrastructure to support AI adoption. Government AI readiness indices consistently rank Africa behind other regions, with studies by Butcher et al. (2021) and Gwagwa et al. (2021) highlighting major gaps in AI capacity. These findings emphasize the urgent need for improved infrastructure, a highly skilled workforce, and strong policy frameworks to advance AI development and integration (Alhosani & Alhashmi, 2024).

The findings of this study indicate that AI readiness across Africa varies widely, with scores ranging from 21.13 in Burundi to 53.94 in Mauritius, averaging 33.46 with a standard deviation of 8.79 (Table 2). This disparity highlights uneven AI preparedness levels. Gwagwa et al. (2021) emphasize Africa's consistently low AI readiness, stressing the need for sustained global collaboration and private-sector investment to bridge gaps. While economic freedom often correlates with Positive Peace, governance effectiveness and institutional stability appear stronger predictors of AI readiness than neoliberal policies alone. On that note, African states face a strategic and ethical dilemma: *Should they aggressively adopt AI to remain competitive globally, or take a cautious approach, prioritizing ethics and social impact?* (Ruttkamp-Bloem, 2021). This dilemma reflects broader challenges in balancing technological progress with responsible governance. Governance factors such as regulatory quality, political stability, control of corruption, and rule of law are crucial in AI readiness. Strong governance fosters policies that encourage ethical AI use and public trust, supporting sustainable AI integration in the public sector (Margetts, 2022)

The development of AI in Western countries has largely been driven by local startups, and a similar approach could be effective in Sub-Saharan Africa countries (Okonto et al., 2023). Despite the distinct characteristics of African nations, a unified framework for AI governance could be highly beneficial such as under the umbrella of the AU or the regional economic organizations like IGAD, ECOWAS (Anthony et.al, 2024). Much like Europe's collaborative approach to technology policy, African nations share cultural commonalities, historical experiences, and value systems that could serve as a foundation for collective policymaking (Dignum, 2017). African governments and other relevant stakeholders need to think carefully about how to create a data governance policy that promotes an inclusive and responsible AI economy (Ndemo & Thegeya, 2022).

Future empirical research should further investigate the indirect and context-specific effects of economic freedom, gender gap, and brain drain on AI readiness. Mediation and moderation analyses could help clarify whether governance factors serve as intermediaries in these relationships, offering deeper insights into the dynamics shaping AI adoption in Sub-Saharan Africa.

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