



ARTIFICIAL INTELLIGENCE AND ECONOMIC EMPOWERMENT OF WOMEN ENTREPRENEURS: THE ROLE OF AI AWARENESS, AI ADOPTION, AND PERCEIVED BENEFIT

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Article History

Received : 2026-07-22

Revised : 2026-08-25

Accepted : 2026-09-02

Published : 2026-09-11

Abstract

This study investigates the influence of artificial intelligence (AI) awareness, AI adoption, and perceived benefits of AI on the economic empowerment of women entrepreneurs. A structured questionnaire was administered to 280 women entrepreneurs across diverse business sectors, and data were analyzed using multiple linear regression. The regression model explained 59% of the variance in economic empowerment ($R^2 = 0.59$, $F(3, 276) = 132$, $p < .001$). AI adoption ($\beta = 0.345$, $p < .001$) and perceived benefits of AI ($\beta = 0.401$, $p < .001$) emerged as significant predictors, while AI awareness did not reach statistical significance ($\beta = 0.098$, $p = .095$). The findings underscore the importance of moving beyond awareness to actual adoption and positive perception of AI as critical pathways for enhancing women's economic empowerment. Implications for policymakers and support organizations are discussed.

Keywords: AI awareness; AI adoption; perceived benefits; economic empowerment; women entrepreneurs; digital entrepreneurship

1. Introduction

Artificial intelligence (AI) has rapidly transformed the global entrepreneurial landscape, offering new tools for decision-making, customer engagement, and operational efficiency (Nambisan, 2017). As AI-driven technologies become increasingly accessible, they present significant opportunities for women entrepreneurs who have historically faced structural barriers in accessing markets, finance, and technology (World Bank, 2022). The intersection of AI and women's economic empowerment represents an emerging area of scholarly inquiry, as researchers and policymakers seek to understand whether technological adoption can serve as a catalyst for reducing gender-based economic disparities (OECD, 2019).

Despite constituting a substantial segment of the global entrepreneurial workforce, women entrepreneurs continue to encounter challenges including limited access to digital infrastructure, lower rates of technology adoption, and persistent gender biases in business ecosystems (Brush et al., 2018; Global Entrepreneurship Monitor, 2022). AI technologies, ranging from machine learning-powered analytics to natural language processing tools, have the potential to mitigate some of these barriers by enabling data-driven decision-making, automating routine business processes, and facilitating market access through digital platforms (Brynjolfsson & McAfee, 2014). However, the extent to which women entrepreneurs are aware of, adopt, and perceive benefits from AI technologies remains insufficiently explored in the empirical literature.

This study addresses this gap by examining three key constructs—AI awareness, AI adoption, and perceived benefits of AI—as predictors of economic empowerment among women entrepreneurs. Economic empowerment, in this context, encompasses financial independence, business growth, and enhanced decision-making capacity. By investigating the relative contributions of these AI-related constructs, the study aims to provide evidence-based insights for policymakers, entrepreneurial support organizations, and technology developers seeking to promote gender-inclusive digital transformation.

2. Literature Review

The concept of digital entrepreneurship, introduced by Nambisan (2017), provides a foundational framework for understanding how digital technologies—including AI—reshape entrepreneurial processes and outcomes. Digital entrepreneurship extends beyond traditional business models by leveraging algorithms, data analytics, and automated systems to create value (Nambisan, 2017). Within this paradigm, AI awareness serves as a prerequisite for technological adoption, as entrepreneurs must first understand the capabilities and limitations of AI tools before integrating them into business operations (Venkatesh et al., 2003). The Technology Acceptance Model and its successor, the Unified Theory of Acceptance and Use of Technology, posit that perceived usefulness and perceived ease of use significantly influence technology adoption decisions (Davis, 1989; Venkatesh et al., 2003), providing theoretical grounding for examining AI-related perceptions among women entrepreneurs.

Prior research has documented persistent gender gaps in technology adoption across both developed and developing economies (World Bank, 2022). Brush et al. (2018) identified systemic biases in venture funding and institutional support that disproportionately disadvantage women-led enterprises. These structural barriers extend to digital technology access, where women entrepreneurs are less likely to adopt advanced technologies due to factors including lower digital literacy, limited access to training programs, and time constraints arising from disproportionate caregiving responsibilities (Global Entrepreneurship Monitor, 2022). The McKinsey Global Institute (2018) estimated that AI could contribute an additional \$13 trillion to global GDP by 2030, yet without deliberate inclusion strategies, women risk being excluded from these economic gains.

Perceived benefits of AI, encompassing expectations of improved efficiency, cost reduction, market reach, and competitive advantage, function as motivational drivers for technology adoption (Davis, 1989). In the context of women entrepreneurs, positive perceptions of AI may be particularly consequential because they can offset risk aversion and resource constraints that typically inhibit entrepreneurial experimentation (Brush et al., 2018). Brynjolfsson and McAfee (2014) argued that the economic returns of AI adoption are contingent upon not merely using the technology but leveraging it to fundamentally transform business processes. Consequently, the relationship between perceived benefits, adoption, and economic outcomes warrants empirical investigation, particularly among women entrepreneurs who navigate unique structural challenges.

3. Methodology

This study employed a cross-sectional survey design. A structured questionnaire was developed based on validated scales from the literature and adapted to the context of women entrepreneurs. The survey instrument measured four constructs: AI awareness (5 items), AI adoption (5 items), perceived benefits of AI (5 items), and economic empowerment (5 items). All items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was pre-tested with a sample of 30 women entrepreneurs to ensure clarity and reliability, after which minor wording adjustments were made. The target population comprised women entrepreneurs operating registered businesses. Using convenience sampling combined with snowball techniques, 280 valid responses were collected from women entrepreneurs across multiple business sectors including retail (26.4%), services (36.8%), manufacturing (14.6%), and online businesses (22.1%). The majority of respondents were aged 26–35 (40.0%), held graduate-level education (45.0%), and were married (63.2%). Approximately 40.4% had been operating their businesses for 2–5 years. All procedures followed ethical guidelines for research involving human participants, and informed consent was obtained prior to data collection.

Internal consistency was assessed using Cronbach's alpha, with all four constructs exceeding the 0.70 threshold: AI awareness ($\alpha = 0.751$), AI adoption ($\alpha = 0.756$), perceived benefits of AI ($\alpha = 0.747$), and economic empowerment ($\alpha = 0.746$). Data were analyzed using multiple linear regression with economic empowerment as the dependent variable and AI awareness, AI adoption, and perceived benefits of AI as independent variables. Prior to regression analysis, assumption checks were performed including tests for normality (Shapiro-Wilk $W = 0.989$, $p = .056$), heteroskedasticity (Breusch-Pagan $\chi^2 = 7.41$, $p = .060$), autocorrelation (Durbin-Watson = 1.84), and multicollinearity (VIF values ranging from 2.30 to 2.53, well below the critical threshold of 10).

4. Results

Descriptive statistics revealed moderate to high mean scores across all constructs: AI awareness ($M = 18.1$, $SD = 3.48$), AI adoption ($M = 18.2$, $SD = 3.62$), perceived benefits of AI ($M = 18.4$, $SD = 3.51$), and economic empowerment ($M = 18.7$, $SD = 3.45$). Skewness values ranged from -0.277 to -0.158, and kurtosis values from -0.837 to -0.461, indicating approximately normal distributions. The correlations among the independent variables were moderate, and variance inflation factors (VIF) confirmed the absence of problematic multicollinearity, with values of 2.30 (AI awareness), 2.39 (AI adoption), and 2.53 (perceived benefits of AI).

The multiple linear regression model was statistically significant, $F(3, 276) = 132$, $p < .001$, explaining 59% of the variance in economic empowerment ($R = 0.768$, $R^2 = 0.590$). The omnibus ANOVA results indicated that AI adoption ($SS = 165.1$, $F = 33.4$, $p < .001$) and perceived benefits of AI ($SS = 211.4$, $F = 42.77$, $p < .001$) were significant predictors, whereas AI awareness ($SS = 13.9$, $F = 2.81$, $p = .095$) did not reach statistical significance at the .05 level.

Examination of the model coefficients (Table 1) revealed that perceived benefits of AI was the strongest predictor ($\beta = 0.401$, $B = 0.395$, $SE = 0.060$, $t = 6.54$, $p < .001$, 95% CI [0.276, 0.513]), followed by AI adoption ($\beta = 0.345$, $B = 0.329$, $SE = 0.057$, $t = 5.78$, $p < .001$, 95% CI [0.217, 0.440]). AI awareness, although positively associated with economic empowerment, did not achieve statistical significance ($\beta = 0.098$, $B = 0.097$, $SE = 0.058$, $t = 1.68$, $p = .095$, 95% CI [-0.017, 0.212]). The intercept was 3.728 ($SE = 0.779$, $t = 4.79$, $p < .001$). Diagnostic analyses, including Cook's distance (mean = 0.004, max = 0.053) and Mahalanobis distance, indicated no influential outliers threatening the validity of the model.

Table 1
Regression Model Coefficients for Economic Empowerment

Predictor	B	SE	t	p	β	95% CI
Intercept	3.728	0.779	4.79	<.001	—	[2.195, 5.261]
AI Awareness	0.097	0.058	1.68	.095	0.098	[-0.017, 0.212]
AI Adoption	0.329	0.057	5.78	<.001	0.345	[0.217, 0.440]
Perceived Benefits	0.395	0.060	6.54	<.001	0.401	[0.276, 0.513]

Note. $R^2 = .59$, Adjusted $R^2 = .58$, $F(3, 276) = 132$, $p < .001$. $N = 280$.

Table 2
Model Fit Summary

Model	R	R ²	F	df1	df2	p
1	0.768	0.590	132	3	276	<.001

Note. Dependent variable: Economic Empowerment. Predictors: AI Awareness, AI Adoption, Perceived Benefits of AI.

Table 3
Reliability Statistics (Cronbach's Alpha)

Construct	Cronbach's α	Items	Assessment
AI Awareness	0.751	5	Acceptable
AI Adoption	0.756	5	Acceptable
Perceived Benefits of AI	0.747	5	Acceptable
Economic Empowerment	0.746	5	Acceptable

Table 4
Descriptive Statistics of Study Variables

Variable	N	Mean	SD	Min	Max	Skewness
AI Awareness	280	18.1	3.48	9	25	-0.204
AI Adoption	280	18.2	3.62	10	25	-0.190
Perceived Benefits	280	18.4	3.51	10	25	-0.158
Economic Empowerment	280	18.7	3.45	9	25	-0.277

Table 5
Demographic Profile of Respondents

Age Group	Count	Percentage	Education	Count	Percentage
18–25	62	22.10%	School	29	10.40%
26–35	112	40.00%	Graduate	126	45.00%
36–45	72	25.70%	Postgraduate	97	34.60%
46+	34	12.10%	Professional	28	10.00%

5. Discussion

The findings of this study provide important empirical evidence regarding the role of AI-related constructs in shaping the economic empowerment of women entrepreneurs. The most striking finding is that perceived benefits of AI emerged as the strongest predictor of economic empowerment, followed by AI adoption. This suggests that women entrepreneurs who perceive tangible advantages from AI technologies—such as improved business efficiency, enhanced market reach, and better decision-making—are more likely to experience economic empowerment outcomes. This finding aligns with the Technology Acceptance Model, which emphasizes perceived usefulness as a primary driver of technology engagement (Davis, 1989). It also resonates with Brynjolfsson and McAfee's (2014) argument that the transformative economic potential of AI is realized not merely through awareness but through active application and integration into business processes.

The significant contribution of AI adoption to economic empowerment ($\beta = 0.345$) reinforces the notion that practical engagement with AI tools—beyond theoretical knowledge—is essential for generating economic benefits. Women entrepreneurs who have incorporated AI into their business operations, whether through customer relationship management systems, automated marketing tools, or data analytics platforms, reported higher levels of economic empowerment. This finding is consistent with Nambisan's (2017) digital entrepreneurship framework, which positions technology adoption as a critical mechanism for value creation. It also supports the OECD's (2019) observation that digital skills and actual technology use, rather than awareness alone, are the key determinants of economic participation in the AI era.

Perhaps the most noteworthy finding is the non-significant effect of AI awareness on economic empowerment. While AI awareness showed a positive direction of association, it did not reach statistical significance at the .05 level ($p = .095$). This result challenges the assumption that simply raising awareness about AI technologies is sufficient to drive economic empowerment among women entrepreneurs. Instead, the data suggest that awareness must be translated into adoption and accompanied by positive perceptions of

AI's utility to yield meaningful economic outcomes. This finding has significant policy implications: interventions focused solely on information dissemination and awareness campaigns may produce limited returns unless they are coupled with hands-on training, access to AI tools, and mentorship programs that foster positive attitudes toward technology (Global Entrepreneurship Monitor, 2022; World Bank, 2022).

6. Conclusion

This study examined the influence of AI awareness, AI adoption, and perceived benefits of AI on the economic empowerment of 280 women entrepreneurs. The regression model explained 59% of the variance in economic empowerment, with AI adoption and perceived benefits of AI emerging as significant predictors, while AI awareness did not achieve statistical significance. These findings underscore the importance of moving beyond awareness to foster actual adoption and cultivate positive perceptions of AI's benefits as pathways to economic empowerment for women entrepreneurs.

The findings carry several practical implications. First, policymakers and entrepreneurial support organizations should prioritize programs that provide women entrepreneurs with hands-on AI training and access to affordable AI tools. Second, initiatives should focus on demonstrating the concrete benefits of AI adoption through case studies, mentorship, and peer networks that highlight successful AI integration among women-led businesses. Third, future research should explore the moderating roles of education level, business type, and cultural context in the relationship between AI-related constructs and economic empowerment. Despite these contributions, the study is limited by its cross-sectional design and reliance on self-reported measures, which constrain causal inference. Longitudinal studies and mixed-methods designs are recommended to deepen understanding of the temporal dynamics and lived experiences of women entrepreneurs navigating the AI landscape.

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