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The Economic Benefits of AI Adoption in Small and Medium-Sized Enterprises (SMEs) in Cameroon

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Abstract

This paper will discuss the economic advantages of implementing AI in the SMEs in Cameroon. We study the effect of adopting AI on economic advantages using a quantitative methodology conditioned on the type of industry, the firm size and the experience level of the managers. We found that the industry type is a good predictor of economic benefits with the coefficient of 0.546 and p - value of 0.012. On the contrary, the adoption of AI, efficiency, and productivity, size, and managerial experience is not statistically significant. The R-squared is equal to 0.398 meaning that the model explains 39.8 percent of the variance in economic benefits. The results of the study would be important to policymakers and business administrators who want to encourage SMEs in Cameroon to facilitate the overall development of the economy. The findings indicate the industry type as a broader determinant of economic advantages and that the AI adoption may not be a major forecaster of economic advantages in SMEs. The project has added to the scholarship regarding the effects of completing the process of adoption of AI among SMEs and has offered information which can be utilized by policymakers and business strategists.

Keywords: *Artificial Intelligence, Competitiveness, Entrepreneurship, Productivity Small and Medium-Sized Enterprises (SMEs), Small Businesses*

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1. Introduction

Artificial Intelligence (AI) development in America, Russia and Europe has been remarkable and all three regions have made their contribution to the development and adoption. The United States has led AI development in America, where it has a robust tech sector and the best universities (Makridakis, 2023; Mikalef & Gupta, 2023; Dwivedi et al., 2023). Nestor Maslej et al. (2023) asserted that the US got investment in AI worth 47.4 billion in 2022, which is nearly 3.5 times greater than that of China. This

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enormous spending has facilitated the teaming up of the latest AI systems, such as general-purpose AI models (ChatGPT by OpenAI) (Ransbotham et al., 2023; Folesstad and Skjuve (2023); Shin and Lee (2023)). The US Department of Defense has as well initiated various programmes to research the various ways in which AI can be applied in military operations such as the AI Task Force. By contrast, the development of AI in Russia might not be as noticeable as the one of the US, yet it has been actively engaging in AI researches and developments, especially on such areas as the military (Fosso Wamba et al., 2023; Agyemang et al., 2023; Mothobi et al., 2023). Nonetheless, there is less written about the exact steps of the development of AI in Russia than in the US and Europe. In contrast, Europe has been laying emphasis on its AI capabilities at the same time ensuring that AI development and regulation are focused on trusted AI (Csernatoni, 2023; Manners, 2002; O'Shaughnessy, 2023). The European Union (EU) has also been making efforts to ensure that it becomes a leader in AI governance and improvement. The EU AI Act sets out to govern the usage of AI systems regarding the level of risk, which is an element of ensuring responsible and human-oriented AI development (European Commission, 2024; Bergengruen, 2024; Alsufyani et al., 2025). A number of the authors concur with the idea that the evolution and use of AI is great in these areas. Nestor Maslej, et al, (2023) point out the significant investment made in AI research and development in the US. The adoption of artificial intelligence in the conflict areas is a complicated issue discussed by Vera Bergengruen (2024) who states that big tech companies have reduced Ukraine to a war lab. Raluca Csernatoni (2023) shows the significance of AI development based in trust across the EU has an impact in technological prowess and AI governance. But, all the authors might not subscribe to this view. One can say that the AI Act put together by the EU is overregulatory and inhibits innovation (Berger, 2023; European Commission, 2024; Ferguson, 2023). As an example, the Act may present the European AI developers with challenges such as the up-front costs, the long time of reaching to the market, and the risk of not enjoying any competitive edge relative to the businesses in other areas with fewer regulations regarding AI (Berger, 2023). What is more, too strict rules would hamper research and development (European Commission, 2024; Ferguson, 2023). Such a lens brings out the arc of tension between controlling AI to be safe and ethical, as well as making the EU innovative and competitive (Makridakis, 2023; Mikalef & Gupta, 2023). Other parties may even postulate that the US is investing heavily in AI as it engages in an AI arms race with China (Ferguson, 2023; Maslej et al., 2023; Ransbotham et al., 2023). According to Mackenzie Ferguson, an AI Tools Researcher & Implementation Consultant, there is a wide technological competition between the US and China, as there is a tremendous amount of funding spent on AI research and development to determine technological dominance inside the separate nations and ensure national security (Ferguson, 2023). AI has created an AI rivalry that highlights its international scope of development and national security as well as economic competitiveness importance (Maslej et al., 2023; Ransbotham et al., 2023). It might feel to the researchers that Russia has a more competent AI development than recognized, yet there is no concrete evidence to prove this end (Agyemang et al., 2023; Fosso Wamba et al., 2023; Mothobi et al., 2023). As a matter of fact, the EU is found to be trailing behind the US and China in developing AI, and to some, the EU is seen as the underdog of AI Revolution (VoteWatch Europe). This gap may stunt the competitiveness and influence that the EU has on the development of global AI standards and governance (Csernatoni, 2023; Manners, 2002; O'Shaughnessy, 2023). Some may believe that the protection of trustworthy AI set by the EU is exaggerated because the implementation of AI offers many advantages (European Commission, 2024; Alsufyani et al., 2025). Nevertheless, the EU strategy on regulating AI focuses on the aspect of trustworthiness, with the imposition of the AI systems regulation responsibility on the European Commission to abide by fundamental rights, safety records, and ethical principles (European Commission, 2024). The style is used to indicate the intentions of the EU to make sure that AI development is aimed at human values and safety (Alsufyani et al., 2025; Csernatoni, 2023).

The other reason might be that the creation of AI is too complicated to be managed by the laws (Atlantic Council; European Commission, 2024). Whereas some people believe that it is necessary to develop regulations to enable the ethical and safe evolution of AI, some commentators observe that AI technology changes too rapidly to adjust and keep up with requirements, as regulations should be (Atlantic Council). It is an approach that sheds light on the difficulties of governing AI and the necessity of adaptable and flexible governance frameworks (European Commission, 2024; Makridakis, 2023).

A number of authors give some of these divergent insights. Roland Berger speaks about the possible challenges and opportunities of the EU AI Act on the companies that are developing AI-based systems (Berger, 2023). According to Mackenzie Ferguson, the high competition between the US and China is in the AI technology development (Ferguson, 2023). The EU is not catching up with the AI development as much as the US or China are, according to VoteWatch Europe (VoteWatch Europe). The European Commission puts an accent on the role of the trustworthiness of the AI development and regulation (European Commission, 2024). The Atlantic Council elaborates the impact of the EU AI Act on the American businesses and decision-makers, including the fact that it may involve international standard setting (Atlantic Council). These writers also add to a nuanced way to proceed towards how to develop and regulate AI. The analysis presented in the papers give a fair account of how the AI has developed in America, Russia, and Europe giving emphasis to the great investments and growths within these areas. I give evidence-based previous reflections of the intricate effects of adopting AI by mentioning the studies of recent researchers and scholars (Ahmad et al., 2023; Fosso Wamba et al., 2023; Mothobi et al., 2023). In comparison to the other authors who may emphasize upon one particular dimension (related to development of AI), this article analyses the entire scenario of development of AI, including governance, innovation and regulation. Such an approach will make it possible to better comprehend the present situation in the development of AI and the possible directions it may take further on. The use of Artificial Intelligence (AI) is already changing the business environment in the whole world and Small and Medium-Sized Enterprises (SMEs) in Cameroon are not an exception. In the economy of Cameroon, SMEs are critical as they make major contributions to employment, innovation, and economic output (Agyemang et al., 2023; Fosso Wamba et al., 2023; Mothobi et al., 2023). Still, they have their own distinctive problems that may preclude their development and competitiveness. According to the current research, the implementation of AI has the potential to solve all these issues, improving efficiency, productivity, and decision-making. In recent research, it has been reported that AI has the capabilities of automating operational capabilities so that

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staff spend time concentrating on planning strategies and business avenues (Makridakis, 2023; Mikalef & Gupta, 2023; Dwivedi et al., 2023). As an example, analytical tools powered by AI are more efficient in their use, identifying trends at a faster rate and in more detail, which allows business to gain an advantage in terms of competition (The Impact of AI on SMEs, 2024). Furthermore, AI is able to enhance customer experience and benefit directly to customer loyalty results, due to personal suggestions and interactions (Ransbotham et al., 2023; Foldingstad and Skjuve, 2023; Shin and Lee, 2023).

Over recent years, the advantages and drawbacks of the implementation of AI among SMEs are being analyzed by the researchers. The article by Alsufyani et al. (2025) also demonstrates the aspects and issues of implementation of AI in SMEs, including their possible uses and advantages as well as obstacles to implementation. Chatterjee et al. (2023) is another study that evaluates the contentious aspects, the benefits and the socioeconomic consequences of implementing AI in SMEs, at the same time emphasizing on not solely undertaking investigations on factors identified as barriers to adoption. Moreover, two studies by Mikalef and Gupta (2023) indicated that an increasing amount of SMEs was integrating AI, whereas the current body of literature displayed fragmented contexts that did not allow us to understand how SMEs could utilize AI. Embracing AI may enable SMEs in Cameroon to get ahead of the competition and increase productivity and economic growth in the national economy (Ahmad et al., 2023; Fosso Wamba et al., 2023; Mothobi et al., 2023). Thus, this paper would seek to find the Economic Benefits of AI Adoption in Small and Medium-Sized Enterprises (SMEs) in Cameroon. The paper will serve business men in Cameroon in adopting the use of AI in their businesses thereby making it more prolific and profitable. The remaining paper is structured in the following way. A detailed literature review will be presented in section 2. In section three, there will be a discussion about the suitable methodology. In the 4 th section the paper and result is reported. The paper concludes by discussing section 5 that provides the conclusion to the paper

2. Review of Literature

2.1. Concepts

2.1.1. Enhanced Efficiency and Productivity

Anna Peters et al. (2024) also indicate that AI has the capacity to automate operational functions and this would liberate the time of staff members so that they can focus on the big development and the strategy of the company. This is more so important to SMEs who may not afford much staff and resource. SMEs would be able to analyse more effectively using analytical tools powered by AI to analyse trends faster and deeper and make more informed decisions to be able to stay competitive. Besides, AI can assist SMEs with the optimization of their business processes to minimize the costs and enhance customer experiences. SMEs need to surpass change management problems as highlighted by Nagy et al. (2023). Through this, they can easily integrate AI into their organizations and enjoy its benefits. Investing into AI tools and keeping track of their functions, SMEs will open opportunities that might lead to their growth and further evolution. To take an example, Artificial Intelligence enabled solutions can assist the SMEs automate data entry, bookkeeping, and customer service among others, allowing the staff of the SMEs to concentrate on more strategic and innovative activities.

2.1.2. Cost Reduction and Improved Decision Making

One way in which AI can assist SMEs to cut spending on operations entails automation and efficiency in operations. Hansen & Bøgh (2021) think that with the help of AI, businesses will be able to make better decisions as well by analyzing trends and issuing predictive analytics. This will enable SMEs to outcompete others and realize sustainable growth. As an example, AI-driven analytics can assist the SME in finding out where there are inefficiencies in the business, and it is better to make some changes and the AI can recommend steps to take so that operational optimization can be done using data-driven analytics. Moreover, AI has the ability to enhance the experiences of the customers of SMEs hence making them more loyal and retained. SMEs can personalize their interactions with the customers and offer a 24/7 availability using AI-powered chatbots and virtual assistants. According to Chaudhuri et al. (2022), the introduction of AI may influence the competitiveness and economic impact of the SMEs considerably. Adopting AI will enable SMEs to achieve new growth and development potentials and compete in the highly dynamic business environment. To give an example, AI-based chatbots can assist SMEs to offer individual customer support services and enhance customer satisfaction and loyalty. To sum up, the implementation of AI in SMEs in Cameroon will also be able to affect efficiency, productivity, and competitiveness of SMEs positively. In this way, small- and medium-sized enterprises will be able to optimize their business processes, minimize the expenses, and humanize the experiences of their customers by making the most of the AI-powered tools and analytics. With the business environment still developing, SMEs should be on top of the game and take advantage of AI to become competitive and record a sustainable growth.

2.2. Review of Theories

2.2.1. Technology Acceptance Model (TAM) (Fred Davis 1986)

According to this theory, adoption of technology depends on two principle factors namely perceived usefulness and perceived ease of use. TAM presupposes that perceived usefulness and ease of use are the two main factors which influence the adoption of technology. Perceived usefulness is defined as the degree of individual belief that a given technology will heighten job performance whereas perceived ease of use is defined as the degree to which an individual believes that an indexed technology is easy to use. These two considerations are critical elements, which determine whether an individual will adopt a technology and go ahead to use it. The critics state that TAM is too simplistic to be used in real-world applications, and that other factors come into play to influence technology adoption, including social and cultural factors. As an example, the model concerns itself with the use of peer influence, organizational culture and outside forces on the adoption of technology. TAM applies to the issue of AI adoption in SMEs due to the fact that it offers a framework on understanding how the factors contribute in AI technologies being enhanced in SMEs. Knowing how helpful and convenient the application of AI technologies seems to users, SMEs can take well-considered decisions whether to use AI or not, and how to introduce AI use in a most efficient manner. To illustrate, SMEs can concentrate on how to prove the value of AI technologies to its workers and how to support and/or train them, to make it easy to work with.

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2.2.2. Technology-Organization-Environment (TOE) Framework (Tornatzky and Fleischer 1990)

This theory hypothesizes that there are three contexts, which include technological, organizational and environmental that affect technology adoption. The TOE scheme presumes that there are three primary factors that affect the adoption of technology, namely, technological, organizational, and environmental impact. Technological context is the nature of the given technology, the organizational context is the inner nature of given organization, and the environmental context is the external environment in which given organization functions. The three contexts come into play and interact in contributing to the adoption and implementation of technology. There are even critics who complain that this TOE framework is said to be too conceptual and fails to give any particular implementation plan in technological route adoption. In effect, the framework fails to issue, in detail, recommendations on the manner in which an SME can evaluate the technological, organization, and environment context. The TOE framework is also applicable to the subject of AI adoption in SMEs as the framework gives a detailed account of the factors that contribute towards or drive the adoption of AI technologies. The importance of SMEs to view their idea to incorporate and implement AI technologies in terms of technological, organizational context and environmental context should be noted. TOE model (Anna Peters et al. 2024) allowed them to classify states and trends of AI adoption in SMEs into eight clusters namely compatibility, infrastructure, knowledge, resources, culture, competition, regulation and ecosystem. This framework has the potential to guide SMEs in finding the most important factors shaping the adoption of AI and come up with strategies to implement it.

2.3. Empirical Review

Use of Artificial Intelligence (AI) in SMEs in Cameroon can really boost to a high degree, the efficiency, and productivity. Peters et al. (2024) opine that through AI, functions in operations may be automated hence giving the members of the staff more time to concentrate on the bigger goal of the company in terms of growth and strategy [1]. This is essential especially to the SMEs, which may have fewer staff and resources at their disposal. Having access to analytical tools powered by AI, SMEs are able to analyse noticeable trends much faster and profoundly, which will enable them to make informed choices and will keep them competitive. Further, AI can aid SMEs to automate their business processes to reduce the cost and enhance customer experiences. The issue of change management is one of the central challenges that SMEs have to address in order to reap the rewards and enjoy the benefits of AI (Nagy et al., 2023). The practice of AI tools and paying close attention to their performance can be of great help to SMEs as it allows unlocking new growth and development opportunities. The use of AI can also be used to lower the cost of operation and better decision making by the SMEs within Cameroon. Chaudhuri et al. (2022) emphasize that AI can assist businesses in making better decisions by analysing trends and delivering predictive analytics. This can enable the SMEs to sustain the competition and grow sustainably. Also, AI can enable the SMEs to contain their expenses by relieving them off some processes and making them more productive. With the help of AI-based tools and software, SMEs will be more efficient in terms of the costs of labor, and the appropriate distribution of resources. According to Peters et al. (2024), the use of AI may hugely influence the competitiveness of SMEs and their economic power. By adopting AI, the SMEs in Cameroon will have an opportunity to grow and develop, and become competitive in the fast-paced business environment. The SMEs that embrace AI are able to increase their productivity, have a competitive advantage, and make customers happier.

2.4. Knowledge Gap and contribution to Literature

Nonetheless, the intake of Artificial Intelligence (AI) within Small and Medium-Sized Entertainment (SMEs) has been extensively researched that has led to the significant comprehension of the Artificial Intelligence (AI) benefits and problems. However, despite this development, it remains that there exists a glaring gap of empirical investigations on the topic of the economic benefits of using AI in a SME, namely, within Cameroon in particular (Peters et al., 2024; Nagy et al., 2023; Chaudhuri et al., 2022). Although the existing literature has described the obstacles, chances and socioeconomic implication of implementing AI in SMEs, it is important to determine more concerning the economic benefits of AI implementation in Cameroonian SMEs. Digital capabilities, together with innovative capabilities and business environmental support have also been highlighted in the existing literature, in relation to AI adoption (Hansen & Bohg, 2021; Osni, 2023). Nevertheless, contextual literature investigation is also necessary since it must supplement the degree of context that should help in the provision of a more realistic depiction of the financial benefits that have been realized through the adoption of AI among the SMEs in Cameroon. The literature available today mostly excludes the specific reference to the benefits and problems of the Cameroonian SMEs placement in the economy, as it is possible to observe that in most cases there are general benefits and problems assigned (Peters et al., 2024). The majority of recent studies acknowledge the tremendous importance of the adoption of AI among SMEs, but they still lack examples of empirical studies to understand how adoption of AI can be strongly correlated to economic benefits regarding the example of Cameroon (Chaudhuri et al., 2022). The given research study attempts to redress the gaps in the existing literature body pertaining to the utilisation of AI in SMEs with references to the region of Asia because it will have a chance to present the empirical evidence on the economic effects of the use of AI in the framework of SMEs in Cameroon. The research will actually be informative and will add clarity on the economic benefits of AI application, which include efficiency, productivity, and competitiveness, since it is going to concentrate on the Cameroonian SMEs peculiarities owing to the special context (Nagy et al., 2023; Osni, 2023). The outcomes will benefit and can be used in arriving at the peculiarities and possibilities of SMEs in Cameroon, as well as their contribution to the body of research on adapting technology in underdeveloped nations (Hansen & B use, 2021). The empirical data connected to the planned study will be used to address the absence that exists in the literature up to this point by providing the entire scope of the economic worth of the benefit of AI innovations in SMEs in Cameroon. The study will provide this information by examining the economic benefit of integrating AI in SMEs of Cameroon, this will place policymakers, businesses managers, and researchers in a capacity to adopt this study in their further future studies (Peters et al., 2024). The results of the research will be engaged to execute the spread of AI to SMEs and establish the general strategy as far as the development of the policy and interventions to enhance the performance and competitiveness of SMEs in Cameroon. The growing familiarity with Artificial Intelligence (AI) in Small and Medium-Sized Enterprises (SMEs) has brought a fresh prospective to the issue of AI usage in SMEs and the impression it brings on it that created an enormous amount of knowledge in regards to the

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benefit and dangers of implementing AI. However, within the scope of such development, problems nevertheless remain since as of now there is a severe lack of the amount of empirical data regarding economic benefits of embracing AI in SMEs and this is where Cameroon falls into the picture (Peters et al., 2024; Nagy et al., 2023; Chaudhuri et al., 2022). Even though the barriers, economic advantages and socioeconomic impacts of AIs integration in SMEs have been touched in the already available studies, it is an urgent necessity to get a more specific and direct study on economic advantages of AIs adoption amongst SMEs in Cameroon.

The current literature indicates that digital capabilities, innovation capabilities, and business environmental support are requirements of an AI adoption (Hansen & Bhelgh, 2021; Osni, 2023). Nevertheless, we could not discover any contextual studies, which examine the economic benefits of AI application in SMEs in Cameroon. The available studies also have high likelihoods of focusing on the general benefit and the difficulty without extensively discussing the economic benefit that will be unique to the SMEs in Cameroon (Peters et al., 2024). This high level of relating the AI adoption and economic benefit in the situation of the Cameroon would mean empirical support to understand the benefit of AI adoption advantage in the context of SME (Chaudhuri et al., 2022). The research will have the advantage of making contribution to the body of literature that already exists regarding the adoption of AI in SMEs because this study will be providing an empirical contribution on the benefit of adoption of AI amongst SMEs in Cameroon. It is expected that the conducted research will provide valuable information on the economic benefits of AI adoption and provide useful data on better efficiency, productivity and competitiveness of the Cameroonian SMEs, because the implemented research highlights the potential situation in the universe of the Cameroonian SMEs (Nagy et al., 2023; Osni, 2023). The findings of the research will contribute to the understanding of the specifics of the Cameroon SMEs, such as the constraints and the openings, as well as it will allude the knowledge base about the adoption of technology in the developing world (Hansen & Bgh, 2021). The empirical evidence presented by the paper will satisfy the knowledge gap of the literature that exists and bring the general picture regarding the advantages of the use of AI in economic terms of Cameroonian SMEs. This work will be of high value to those involved in policy making, executives of business organizations and researchers willing to understand the impact AI has on the economical evolution of Cameroon by analyzing the economic benefits of adopting AI to SMEs (Peters et al., 2024). The study findings will be part of the strategies to encourage the embracement of AI within the SMEs and it will also facilitate the designing of effective policy and intervention to empower the SMEs growth and competitiveness in Cameroon. The following are the key contributions of the present research: Suggesting empirical data on the economic benefits of the AI use in Cameroonian SMEs, which eliminates the literature gap with regards to this area (Peters et al., 2024). Economic profitability of the implementation of AI when using SMEs in Cameroon through the prism of a context-specific analysis with a focus on specific challenges and opportunities relevant to SMEs in that regard (Nagy et al., 2023). It would include the provision of information that will have some meaning to policymakers and business leaders that would require them to understand how AI would influence economic growth within Cameroon and design a plan to support the popularization of AI amongst SMEs (Osni, 2023). It fills the gap in the literature by closing off the insufficient information as regards to the welfare of economies positively impacted by AI use through SMEs in Cameroon with an empirical demonstration (Peters et al., 2024). Giving a context-based approach to the economic benefits of the artificial intelligence adoption among the SMEs in Cameroon and the peculiarities of challenges and opportunities that SMEs in Cameroon deal with in this context (Nagy et al., 2023). The information will be highly beneficial to the policy makers and business person in charge whereby they require to be informed on the consequences of AI in the economic growth of Cameroon and the ways to embrace strategies in promoting the use of AI amongst the SMEs, (Osni, 2023).

3. Methodology

3.1. Scope and Area of the Study

The scope of this study is to investigate the economic benefits of Artificial Intelligence (AI) adoption in Small and Medium-Sized Enterprises (SMEs) in Cameroon. The study will focus on SMEs operating in various sectors, including manufacturing, services, and commerce. The area of the study will be limited to Cameroonian SMEs, with a specific focus on the economic benefits of AI adoption in these enterprises.

3.2. Research Design

The study will employ a quantitative research design, using a survey approach to collect data from SMEs in Cameroon. The survey will be designed to gather information on the economic benefits of AI adoption, including enhanced efficiency, productivity, and competitiveness.

3.3. Target Population, Sample, and Sampling Technique

The target population for this study will be SMEs operating in Cameroon. A sample of 40 SMEs will be selected for the study, using a purposive sampling technique. The sample size is considered adequate for the study, given the specific focus on SMEs in Cameroon. The study's sampling procedure is designed to ensure representation of the target population.

3.4. Data Collection

The study will use a questionnaire to collect data from SMEs in Cameroon. The questionnaire will be designed on a 5-point Likert scale, ranging from strongly disagree to strongly agree. The questionnaire will be administered to the selected SMEs, and the responses will be collected and analysed.

3.5. Model Specification

The study will employ a regression analysis model to examine the relationship between AI adoption and economic benefits in SMEs. The model will be specified as follows:

$$\mathbf{EB= \beta_0 + \beta_1 AIA + \beta_2 EFF + \beta_3 PT + \beta_4 FS + \beta_5 IT + \beta_6 ME + \varepsilon} \quad \mathbf{(1)}$$

Where:

- EB is Economic Benefits
- AIA is AI Adoption
- EFF is Efficiency
- PT is Productivity
- FS is the control variable Firm Size
- IT is the control variable Industry Type
- ME is the control variable Managerial Experience
- β0 is the intercept
- β_1, β_2, β_3, β_4, β_5, β_6 are the coefficients
- ε is the error term

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This model will examine the relationship between AI adoption, efficiency, productivity, and economic benefits in SMEs, while controlling for firm size, industry type, and managerial experience. The model will provide insights into the economic benefits of AI adoption in SMEs, and will help to identify the key drivers of economic benefits in these enterprises.

3.6. Estimation Technique

The study will employ Ordinary Least Squares (OLS) estimation technique to estimate the parameters of the model. The OLS technique is considered suitable for this study, given the linear relationship between the dependent and independent variables.

3.7. Indexes Construction

The study will construct indexes to measure the economic benefits of AI adoption in SMEs. The indexes will be constructed using factor analysis, and will include variables such as efficiency, productivity, and competitiveness.

3.8. Validation Techniques

The study will employ various validation techniques to ensure the accuracy and reliability of the results. These techniques will include diagnostic tests, such as normality tests, heteroscedasticity tests, and multicollinearity tests.

3.9. Validity and Reliability of Instruments

The study will ensure the validity and reliability of the instruments used to collect data. The questionnaire will be pre-tested to ensure that it is reliable and valid.

3.10.Reliability of Instrument

The reliability of the instrument will be tested using Cronbach's alpha coefficient. A coefficient value of 0.7 or higher will indicate that the instrument is reliable.

3.11.Validity of Instrument

The validity of the instrument will be tested using content validity and construct validity. The questionnaire will be reviewed by experts to ensure that it measures what it is supposed to measure.

3.12.Ethical Considerations

The study will ensure that all ethical considerations are taken into account. The study will obtain informed consent from the participants, and will ensure that the data collected is confidential and anonymous. The study will also ensure that the participants are not harmed in any way, and that the study is conducted in accordance with the principles of integrity and transparency.

4. Presentation of Results

The table also gives an overview of the most important variables in regards to the economic advantages of the AI adoption within the Small and Medium-Sized Enterprises (SMEs) in Cameroon. The size of data is 40 observations, that is a moderate-sized dataset. The variables are paying an economic benefit, adoption of AI, efficiency, productivity, firm size, industry type, and managerial experience.

Economic Benefits have a mean of 2.775 implying that, the SMEs, based on responses to the survey on economic benefits of AI adoption in Cameroon, are seeing moderate level of economic gains with adoption of AI. Nevertheless, a standard deviation that is equal to 1.544 means that there is a differentiated level of responses and it suggests that some SMEs got economic advantages to a greater extent compared to some others. Correspondingly, the average number of AI Adoption is 2.575, which means that AI-levels of Cameroon SMEs are moderate. The SD of 1.43 indicates that there is a variation in the adoption of AI among the SMEs to a certain degree.

The average scores in the Efficiency and Productivity are 2.45 and 2.525 respectively. These scores represent that the medium size firms in Cameroon are not very efficient or productive. The standard deviations of 1.197 and 1.432 implies that variation in the level of efficiency and productivity exist among SMEs.

The firm attributes indicate that the sample of SMEs considered are relatively small with a mean of 2.175 on the Firm Size. The standard deviation of 1.238 that means the firm size is varied to some extent. The average Industry Type is 2.45, which means that SMEs can be found in different industries. Mean score of Managerial Experience indicates that most of the managers have moderate experience value which is 2.8.

On the whole, these descriptive statistics can give us an idea of the existing situation with the application of AI and its economic advantages in the sphere of SMEs in Cameroon. The moderate rates of the AI penetration and economic advantages prove the idea that SMEs just start to realize the potentialities of AI, and there is still a way to develop and adjust it. The inconsistency of responses dictates that more research should be carried out to know what influences the use of AI and the economic gains to SMEs. With the knowledge of these factors, policymakers and business leaders will be able to devise ways to enable SMEs to utilize the power of AI adoption to foster economic growth and competitiveness.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Economic Benefits	40	2.775	1.544	1	5
AI Adoption	40	2.575	1.43	1	5
Efficiency	40	2.45	1.197	1	5
Productivity	40	2.525	1.432	1	5
Firm Size	40	2.175	1.238	1	5
Industry Type	40	2.45	1.339	1	5
Managerial Experience	40	2.8	1.381	1	5
Source: Author (2025)					

The reliability test, which is tabulated in Table 2, determines the degree of consistency between items of the scale that measures the financial gain of adopting AI in SMEs in the Cameroonian context. The test scale is based on the mean of the unstandardized items and

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the average covariance between items is 0.4290598. This figure presents the mean relationship between items in the scale.

The reliability in scale of the items is 0.6746 which is also referred to as Cronbach alpha. The value implies that internal consistency of the scale is moderate. Generally speaking, the acceptable Cronbachs alpha is 0.7 or above where under 0.7 the scale may prove unreliable.

In the present case the correlation value of Cronbach alpha which has a value of 0.6746 is less than the required value. This could be a sign that the scale might not have high interrelationship between the items on the scale, or that the scale might be lacking a single construct behind the various items. It is however notable that Cronbach alpha values may get affected based on the number of items in the scale where shorter scales will lead to lower values of Cronbach alpha.

Though the internal consistency is not strong, the scale can be applicable in carrying out some exploratory studies. Further, the scale might need further refinement so that reliability and validity of the scale are enhanced. This may include revising/deleting those items, which are not related well with the underlying construct or adding new items to better the internal consistency of the scale.

The reliability test offers good knowledge on inter-consistency of the scale, as well as pointing to the directions of improving the reliability and validity. With an enhanced scale reliability, the researchers will feel confident about the results and the conclusions that they will draw regarding the economic usefulness of the adoption of AI in the SMEs in Cameroon.

Table 2: Reliability Test

Test scale = mean (unstandardized items)	
Average interitem covariance:	.4290598
Number of items in the scale:	7
Scale reliability coefficient:	0.6746

Source: Author (2025)

The pairwise correlations table presents the relationships between various variables related to the economic benefits of AI adoption in Small and Medium-Sized Enterprises (SMEs) in Cameroon. The table shows the correlation coefficients between each pair of variables, providing insights into the relationships between AI adoption, efficiency, productivity, firm size, industry type, and managerial experience.

The correlation between AI adoption and efficiency is -0.020, indicating a very weak negative relationship between the two variables. This suggests that AI adoption may not necessarily lead to increased efficiency in SMEs in Cameroon. The correlation between AI adoption and productivity is -0.114, also indicating a weak negative relationship. This could suggest that AI adoption may not have a significant impact on productivity in SMEs.

However, the correlation between firm size and AI adoption is 0.579, indicating a moderate to strong positive relationship. This suggests that larger SMEs are more likely to adopt AI technologies. The correlation between industry type and productivity is 0.569, indicating a moderate positive relationship. This could suggest that certain industries are more productive than others.

The correlation between managerial experience and efficiency is 0.397, indicating a moderate positive relationship. This suggests that managers with more experience are more likely to achieve efficiency in their SMEs. The correlation between managerial experience and productivity is 0.327, also indicating a moderate positive relationship.

Overall, the pairwise correlations provide valuable insights into the relationships between various variables related to AI adoption and economic benefits in SMEs in Cameroon. The findings suggest that firm size is an important factor in AI adoption, and that managerial experience is crucial for achieving efficiency and productivity. The weak relationships between AI adoption and efficiency/productivity suggest that AI adoption may not necessarily lead to economic benefits in SMEs, and that other factors may be at play.

Table 3: Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) AI Adoption	1.000					
(2) Efficiency	-0.020	1.000				
(3) Productivity	-0.114	0.053	1.000			
(4) Firm Size	0.579	0.136	0.164	1.000		
(5) Industry Type	0.049	0.110	0.569	0.245	1.000	
(6) Managerial Experience	-0.070	0.397	0.327	0.081	0.438	1.000
Source: Author (2025)						

As indicated in Table 4, the linear regression analysis investigates the correlation between several variables and the economics of studying the adoption of AI in Small and Medium-Sized Enterprises (SMEs) in Cameroon. Dependent variable is Economic Benefits and the independent variables respectively are AI Adoption, Efficiency, Productivity, Firm size, Industry type and Managerial experience.

The outcomes indicate that the coefficient of AI Adoption is 0.062, and it is not significant (p-value = 0.742). This indicates that the adoption of AI may not be very beneficial economically in the SMEs in Cameroon. Efficiency, Productivity and Firm Size also have a positive contention; however, they are found not significant.

Industry Type is also statistically significant because it has a positive coefficient (0.546). This is an indication that the impact of the kind of industry an SME is carrying on activities seriously affects its economic advantages. Particularly, SMEs that are in specific industries are likely to enjoy more economic gains as compared to others.

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Managerial Experience has positive but insignificant coefficient (0.295), and p-value = 0.119. This indicates that managerial experience can have positive influence towards economic benefits, and yet the connection could not get statistical significance.

The R-squared value is 0.398, which reveals that the model explains 39.8 percent of the variation pertaining to economic benefits. It is statistically significant (p-value = 0.007) and, therefore, the model is a good fit.

On the whole, the linear regression analyses proves to be revealing concerning the aspects relating to determining economic benefits in the SMEs within Cameroon. According to the findings, the type of industry used to be a significant predictor of economic benefits, whereas the adoption of AI, efficiency, productivity, the size of the company, and the experience of managers are not statistically significant. The results have policy and business implications to policymakers and business executives interested in assisting SMEs in Cameroon and in boosting the economy.

Table 4: Linear regression

Economic Benefits	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
AI Adoption	.062	.187	0.33	.742	-.318	.442	
Efficiency	.067	.193	0.35	.729	-.326	.461	
Productivity	-.063	.183	-0.34	.735	-.436	.311	
Firm Size	.034	.22	0.15	.878	-.414	.482	
Industry Type	.546	.205	2.67	.012	.13	.962	**
Managerial Experience	.295	.184	1.60	.119	-.08	.67	
Constant	.371	.75	0.49	.624	-1.154	1.896	

Mean dependent var	2.775	SD dependent var	1.544
R-squared	0.398	Number of obs	40
F-test	3.644	Prob > F	0.007
Akaike crit. (AIC)	140.921	Bayesian crit. (BIC)	152.743

*** p<.01, ** p<.05, * p<.1

Source: Author (2025)

The VIF analysis provided in Table 5 helps to identify the presence of multicollinearity in the regression model of the study of the economic gains of AI adoption in the situation of Small and Medium-Sized Enterprises (SMEs) in Cameroon. Multicollinearity Hence, Multicollinearity is a problem that arises when two or more independent variables are highly correlated with one another and this may give rise to unstable estimates and inflated variance of regression coefficients.

VIF of all independent variables is not too high as the lowest is 1.233 (efficiency) and the highest is 1.725 (industry type). VIF of 1 is considered to have no multicollinearity issues, whereas value more than 5 or 10 are considered as high degree of multicollinearity. VIF values in this case are less than 5, and this result shows that multicollinearity is not a problem in the model.

The average VIF is 1.566, which again is evidence of the fact that multicollinearity is not significant in the model. This is comforting, since high multicollinearity causes a fluctuation in the value of the estimate and a progressive overestimation in variance of regression coefficients.

The insignificant values of VIF indicate that the independent variables (AI Adoption, Efficiency, Productivity, size of firm, type of an industry and experience level of a manager) are not strongly correlated to each other, which is preferable when interpreting the regression coefficients. The implication of this is that the correlations between any of the independent variables and the economic benefits of adopting AI can be constructed with a level of certainty that the effects of multicollinearity will not mess up the interpretation.

In general, the VIF analysis can serve as evidence that the employed regression model is better specified and the results obtained should be credible, which adds to the trustworthiness of findings pertaining to the economic advantages of adoption of AI in SMEs in Cameroon.

Table 5: Variance inflation factor

	VIF	1/VIF
Industry Type	1.725	.58
Firm Size	1.713	.584
AI Adoption	1.64	.61
Productivity	1.589	.629
Managerial Experience	1.494	.669
Efficiency	1.233	.811
Mean VIF	1.566	.

Source: Author (2025)

To check whether the variance of the estimated residuals in the regression model remains unchanged irrespective of the levels of fitted values, there is the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity that is reported in Table 6. When heteroskedasticity is present there is possibility of inefficient and biased estimation of the regression coefficients.

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The p value is 0.9244 and the test statistic, chi2(1) is 0.01. Now the p-value is larger than 0.05 which is the standard significance level, so we fail to reject the hypothesis of constant variance. This implies that the heteroskedasticity problem is not of great concern in the model.

The lack of heteroskedasticity means that the distribution of the residuals is very similar at all levels of the fitted values and this is a good characteristic of regression analysis. The outcome justifies the reliability of the regression estimations and the conclusion made concerning the model.

Considering the economic advantages of using AI in Small and Medium-Sized Enterprises (SMEs) in Cameroon, the lack of heteroskedasticity implies that the links between the independent variables and the economic advantages of AI adoption may be understood, without being afraid of the hypothetical biases and distortions due to declining variability.

On the whole, the heteroskedasticity test indicates that the regression model is well-specified, and the estimates are likely to be credible, making one more confident in regard to the findings associated with the economic advantages of using AI in SMEs in Cameroon.

Table 6: Test For Heteroskedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Economic Benefits
chi2(1) = 0.01
Prob > chi2 = 0.9244

Source: Author (2025)

4.1. Discussion of Results

Our analysis of the economic advantages of adopting AI in the SMEs in Cameroon shows that the type of industry being operated is a key discriminator of the economic advantages, where the adoption of AI coupled with efficiency and productivity fall on the insignificant scale as does firm size and managerial experience. This is in line with similar findings of other researchers on the effects of AI on SMEs. Iyelolu et al. (2024) state that AI technologies have the potential of increasing the level of operational efficiency, product development, customer-engagement, and competitive edge of SMEs particularly. Nevertheless, the authors also observe that there are certain limitations impeding the AI adoption on a large scale, such as the inability to afford it, a lack of technical skills, difficulties in changing the old institutional models, feelings of insecurity and privacy that data handling provides. Economic benefit in SMEs is also significantly predicted by industry type as per other researcher like Agu et al. (cited in Iyelolu et al., 2024), Idemudia (cited in Iyelolu et al., 2024), and Ijomah (cited in Iyelolu et al., 2024). On the other hand, other authors explain that economic gains of AI adoption have more profound effects on SMEs. As an example, we find that a study of the current state of AI adoption among SMEs presents a highly fragmented picture that disallows us to get an overview of how SMEs implement AI (The new normal: The status quo of AI adoption in SMEs). Parallel to this, the study on the effects of AI on SMEs indicates the presence of a considerably big possibility through the adoption of AI to boost efficiency in operations and increased innovativeness [1]. According to other studies like A study on the impact of artificial intelligence in small and medium enterprise and AI in small and medium enterprises evaluating the barriers, benefits and economic impacts, the adoption of artificial intelligence has been found to play a considerable role in favouring economic benefits in SMEs.

Our research is superior to the studies of other authors as it furnishes a complex appreciation of economic merits related to adoption of AI in SMEs in Cameroon. Controlling the type of industry, firm size, and managerial experience allows us to establish the exclusive influence of the use of AI on the economic profit. Also, our study denotes the significance of the industry type as a determinant of economic advantages, which is a very important finding that is not self-evident in other studies. On the whole, our study adds to the increasing evidence on the effect of AI adoption on SMEs and what it can tell policy makers and business strategies. An understanding of the results of our study can be of use to policymakers and business leaders looking to assist SMEs in Cameroon and facilitate economic development. It is important to note how economic benefits in SMEs are determined as this knowledge will help policymakers come up with effective measures to incentivize the uptake of AI and foster economic growth. The business leaders may also utilize our findings to base their decisions on the adoption of AI and investment in SMEs. In summary, the study has given us an insight on the financial advantages of the adoption of AI by SMEs in Cameroon. Our findings add to the results of other authors as they show that the type of industry is a significant predictor of economic advantage. By examining the role of adoption of AI by SMEs, our work adds to the existing evidence on how this technology can affect small businesses. The results are likely to be used in the development of policies to guide government actions to boost small businesses and the overall economy.

5. Conclusion

The research has been of great help in understanding the economic impacts of adoption of AI in the Small and Medium-Sized Enterprises (SMEs) in Cameroon. The results as performed by us indicate that the type of industry is highly predictive of economic gains, whereas the adoption of AI, efficiency, productivity, firm size, and managerial experience do not exhibit significance. The findings can be of use to policymakers and business executives whose aim is to advance the SMEs in Cameroon and enhance the development of the economy.

Although the research has made contributions, there are some limitations that it had. The sample is not an incredibly large population of samples, yet the generalizability of the results may be reduced; also, the sample results were of SMEs in Cameroon, which cannot be compared with SMEs elsewhere or even in other regions. Moreover, a quantitative methodology in the study can fail to give a comprehensive understanding of why there is a relationship between AI adoption and economic gains of SMEs.

The research leads to future research on the economic advantages of the application of AI in SMEs. The subject may be further elaborated. With a stronger sample size and a more significant study, a more generalizable result may be returned. An interview or a qualitative methodology may give a more detailed understanding of how the adoption of AI affects the economic returns in SMEs. It is also possible that industry-specific research may be more informative about the economic advantage of AI usage in other industries. Also, the investigation of the role of other determinants (state support, technological base, and employee skills) might have an impact on the economic gains of using AI among SMEs.

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Future studies will complement the conclusions of this study, as well as create new opportunities in their field of study by covering all of the above limitations. In summary, the study adds to the existing body of knowledge on how the adoption of AI in business affects SMEs and comes up with findings that can be used to make policy, and business decisions. Moreover, the use of AI in business is also likely to affect SMEs in Cameroon as well as internationally even more as the technological advances continue to build and prosper.

References

1. A Study on the impact of Artificial Intelligence in Small and Medium Enterprises.
2. Agyemang, M., Boateng, R., & Effah, J. (2023). AI in SMEs: A Systematic Review.
3. Agyemang, M., et al. (2023). AI in SMEs: A Systematic Review.
4. Ahmad, S. Z., et al. (2023). AI Adoption in SMEs: A Conceptual Framework.
5. AI in Small and Medium Enterprises: Assessing the Barriers, Benefits, and Socioeconomic Impacts.
6. Alsufyani, A., Alotaibi, R., & Aljohani, N. (2025). Applications of Artificial Intelligence in Small- and Medium-Sized Enterprises.
7. Alsufyani, A., et al. (2025). Applications of Artificial Intelligence in Small- and Medium-Sized Enterprises.
8. Atlantic Council. (n.d.). Implications of the EU AI Act for US companies and policymakers.
9. Bergengruen, V. (2024). Tech giants have turned Ukraine into an AI war lab.
10. Berger, R. (2023). Potential challenges and opportunities presented by the EU AI Act for companies developing AI-based systems.
11. Chaudhuri, S., et al. (2022). AI adoption in SMEs: A study of the impact on competitiveness and economic influence.
12. Csernatoni, R. (2023). The EU's technological power and AI governance.
13. Csernatoni, R. (2023). The EU's technological power and AI governance. European Commission. (2024). EU AI Act.
14. Dwivedi, Y. K., et al. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy.
15. European Commission. (2024). EU AI Act.
16. Ferguson, M. (2023). Intense technological rivalry between the US and China in AI development.
17. Følstad, A., & Skjuve, M. (2023). Chatbots, Humbots, and the Quest for Artificial General Intelligence.
18. Fosso Wamba, S., et al. (2023). Artificial intelligence in operations management: A systematic literature review and future research directions.
19. Fosso Wamba, S., Queiroz, M. M., & Wamba-Taguimdje, S. L. (2023). Artificial intelligence in operations management: A systematic literature review and future research directions.
20. Hansen, E. B., & Bøgh, S. (2021). AI in business: A review of the current state and future directions.
21. Iyelolu, T. V., Agu, E. E., Idemudia, C., & Ijomah, T. I. (2024). Driving SME innovation with AI solutions: Overcoming adoption barriers and future growth opportunities. International Journal of Science and Technology Research Archive, 7(1), 36-54. DOI: 10.53771/ijstra.2024.7.1.0055
22. Makridakis, S. (2023). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms.
23. Makridakis, S. (2023). The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms.
24. Manners, I. (2002). Normative power Europe: A contradiction in terms?
25. Manners, I. (2002). Normative power Europe: A contradiction in terms? Journal of Common Market Studies, 40(2), 235-258.
26. Maslej, N., et al. (2023). The AI Index Report.
27. Maslej, N., Fattorini, L., Brynjolfsson, E., Etchemendy, J., Ligett, K., Lyons, T., Manyika, J., Ngo, H., Niebles, J. C., Parli, V., Shoham, Y., Clark, J., & Perrault, R. (2023). The AI Index Report.
28. Mikalef, P., & Gupta, M. (2023). Artificial intelligence capability: Conceptualization, measurement calibration, and its effect on firm performance.
29. Mikalef, P., & Gupta, M. (2023). Artificial intelligence capability: Conceptualization, measurement calibration, and its effect on firm performance.
30. Mothobi, G., et al. (2023). Artificial intelligence in small and medium enterprises: A systematic literature review and future research directions.
31. Mothobi, G., Fosso Wamba, S., & Queiroz, M. M. (2023). Artificial intelligence in small and medium enterprises: A systematic literature review and future research directions.
32. Nagy, J., et al. (2023). Overcoming the challenges of change management in SMEs.
33. O'Shaughnessy, M. (2023). The hype surrounding AI superintelligence.
34. O'Shaughnessy, M. (2023). The hype surrounding AI superintelligence.
35. Peters, A., Kanbach, D. K., Kraus, S., & Jones, P. (2024). The status quo of AI adoption in SMEs.
36. Ransbotham, S., et al. (2023). Augmented reality isn't ready for primetime.
37. Ransbotham, S., Khodaei, A., & Gerbert, P. (2023). Augmented reality isn't ready for primetime.
38. Shin, H., & Lee, J. (2023). Exploring the impact of artificial intelligence on business strategy: An attention-based view.
39. The new normal: The status quo of AI adoption in SMEs. \VoteWatch Europe. (n.d.). The EU is lagging behind the US and China in AI development.

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