On The Effects Of Artificial Intelligence On Economic Growth And Finacial Performance In The Asean Countries

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ABSTRACT

Examining the effect of economic growth, financial and financial performance on the acquisition of artificial intelligence (AI) in the ASEAN nations of the world is the primary goal of the current literature. This study retrieved data from the World Bank banking database covering the ASEAN countries from 2001 to 2017 for the hypotheses testing. The findings showed a positive relationship between artificial intelligence adoption in the ASEAN countries and economic growth, financial development, and financial performance. These findings advised the agencies responsible for creating and enforcing regulations to concentrate on the economic, financial, and non-financial health of the businesses in order to improve their capacity to integrate artificial intelligence into their operations.

Keywords: Artificial Intelligence, Economic Growth, Financial Performance, ASEAN countries.

I. INTRODUCTION

Extensive terms, including "machine intelligence," "intelligence agents," "intelligent behaviour," "intelligent systems," and "algorithms" have been used to describe the enormous field of AI. AI was once considered to be a technology that could analyse, make choices, and behave like humans. Moreover, this perspective has grown to take into account vaguely humanoid AI, including acting and perceiving the environment similarly to humans (Russell et al. 2003). The most significant impacts on AI and business, according to Purdy and Daugherty (2016), have come from the latest developments in deep learning, intelligent agents, language processing, voice recognition, learning techniques, and robotics.

Despite having one of the strongest financial systems in the world, the Association of Southeast Asian Nations (ASEAN) is making an alarming pace toward the Sustainable Development Goals (SDGs). The other SDGs, notably those related to ecological growth, like environmental policy, life below the water, and life on land, have not made as much impact (UNESCAP 2021). The development of ASEAN's SDGs could be accelerated by cutting-edge artificial intelligence (AI) technology.

Galaz et al., (2021); Nishant et al., (2020), among others, have provided examples of research that highlight the advantages of AI applications for accomplishing the SDGs. 79% of the 169 SDGs goals have a favourable global effect from AI, especially 82% of the social, 93 percent of the ecological, and 70% of the economic targets. Similar to developed nations like Japan, European Union, and the US, ASEAN has employed AI to promote the SDGs.

Additionally, AI-enabled projects can advance social and environmental goals. For instance, Malaysia's "City Brain" concept has been put into action to enhance urban planning. In the meantime, the "AiMASK" project has been started to promote mask use during the COVID-19 pandemic, the "Doctor Raksa" scheme to provide e-health, and an AI program to advance diagnostic methods for diabetic eye disease in an effort to meet its health-related targets. With help from the US, Indonesia, the Philippines, and Viet Nam have developed an image recognition tool to track and manage plastic waste and marine contamination for environmental development.

Despite the benefits offered by AI technologies, ASEAN is having a lot of trouble using AI techniques. ASEAN is lagging in AI preparedness

and resilience terms of AI preparedness and resilience, ASEAN is now lagging behind, whereas more advanced countries are best placed to gain from cutting-edge AI technology. AI resilience is the capacity of economies to adjust to structural reforms brought on by AI and technical innovation, whereas AI preparation is the capacity of firms and consumers to utilize the opportunities given by AI (Pau et al., 2017). Thus, expenditure and involvement in AI technology, the capacity to innovate in AI, digital literacy, human capital, data, and infrastructure may all be factored in determining an organization's level of preparedness for AI.

1.1 RESEARCH AIM

This research seeks to highlight some important uses AI applications, the effect of AI on economic growth, and the change in marketing in ASEAN nations.

1.2 RESEARCH GAP

The modest adoption of AI techniques in business areas contrasts sharply with the development of AI legislation and policy. As a result, there may be a chance for ASEAN countries to establish a solid basement for AI policies, AI governance, and ethics, as well as government digital competence and flexibility. Prior adoption of AI frameworks and plans will ensure the security and privacy of all pertinent stakeholders and, as a result, promote the use of AI in both the private and public sectors.

2. LITERATURE REVIEW

Soni et al., (2019) This essay concentrates on the overall effects of AI on enterprises, including future changes to business models as well as research, innovation, and market deployment. To reach this whole impact, we develop a three-dimensional study design based on Neo-Schumpeterian theory, invention, expertise, and entrepreneurship. The first dimension relates to AI innovation and research. The second component examines how AI is affecting the world economy and the specific goals of enterprises, and the third dimension examines how AI is altering corporate environments. The research also examines the impact of AI on actors and their negative aspects.

Chen et al (2021) Made an analytical model for the use of AI in business-to-business sales as the aim of this research. Depending on a content analysis of

59 publications published in scholarly journals with peer review, a conceptual development method has been used to determine the motivations, constraints, strategies, and effects of using AI in B2B marketing. The analytical model created by fusing information processing theory with OLT opens up new research directions and offers a thorough framework for ongoing investigation. This article makes contributions to both the B2B and AI literature.

Aggarwal & Jain (2020) A strategy for improving customer experience through technology is called artificial intelligence marketing. Marketers can evaluate a large quantity of information, conduct personalized sales, and meet client needs with the aid of AI. The authors of this research have examined the entire idea of applying artificial intelligence to marketing. This essay includes a section about putting various AIM tactics into practice. The consequences of AIM technology throughout the customer life cycle have been carefully examined by the authors. Finally, a thorough sector- and region-level analysis is provided.

Nguyen & Bui (2022) New technology is incorporated into every aspect of a company through digital transformation, which calls for the alteration of existing business structures. In a similar vein, AI is a recent disruptive technique that has the ability to have a significant influence on business. Advanced analytical models that help organizations increase revenue and improve user interaction, production performance, and quality of service have been created using cognitive techniques that mimic human behaviour and reasoning. Descriptive, predictive, and prescriptive analytics form the foundation of these decision-making models. It is necessary to have a legal framework that controls all digital development consistently across nations and makes it possible for the digital transformation process to be completely regulated. The digital revolution must not be hampered by this regulatory framework.

3. RESEARCH METHODOLOGY

Examining the influence of economic growth (EG), financial development (FD), and financial performance (FP) on the acquisition of AI in ASEAN nations is the main goal of the current

article. This study retrieved data from the World Bank banking database covering the ASEAN countries from 2001 to 2017 for the hypotheses testing. The country's GDP is used to calculate EG, whereas foreign direct investment is used to measure FD (FDI). Additionally, the ROA calculates FP. The rise in operational efficiency and the size of banks, which are employed as a control variable and assessed by the logarithm of total assets (LNTA) , are used to evaluate the dependent variable, such as the adoption of artificial intelligence (AAI).

3.1 Research Hypothesis

H1: Artificial intelligence use in ASEAN nations has benefited from economic expansion.

H2: The deployment of artificial intelligence in the ASEAN nations has benefited from financial development.

H3: The deployment of artificial intelligence in the ASEAN nations has benefited from financial performance.

3.2 Research Framework

Economic growth

Financial development

Financial performance

Artificial intelligence
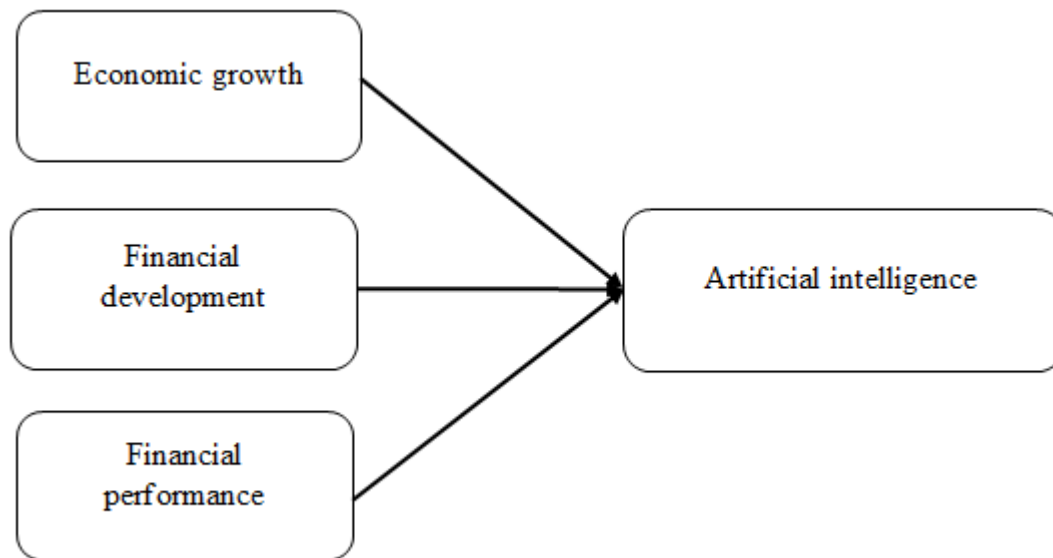
4. RESULTS AND DISCUSSION

The goal of this study is to investigate how EG, FD, and FP have impacted the use of AI in ASEAN nations' financial systems. The explanations for the constructs mean, maximum, standard deviation, and minimum values, correlation matrix, all regression assumptions, and correlation matrix are all included in the results section. In descriptive statistics, variables like mean, maximum, standard deviation, and minimum values are explained. The constructions' descriptive statistics are displayed in Table 4.1 below.

Table 4.1 Descriptive Analysis

Variable	Orbs	Mean	Std.Deviation	Min	Max
AAI	150	1.581	0.657	-0.297	2.734
EG	150	1.019	0.125	0.112	0.617
FD	150	0.194	0.165	0	1.758
FP	150	0.285	0.141	0	1.892
LNTA	150	9.451	0.241	102.122	213.152

The multicollinearity problem in the study is confirmed by the correlation matrix, which also illustrates the correlation between the constructs. The statistics support the multicollinearity assumption and demonstrate that concepts are interrelated. The constructs' correlation matrix is provided in Table 4.2 below.

Table 4.2 Correlation matrix

Variables	Aai	Eg	Fd	Fp	Lnta
AAI	1				
EG	-0.137	1			
FD	0.907	0.152	1		
FP	-0.145	0.085	-0.017	1	
LNTA	0.194	0.275	-0.636	-0.8	1

The initial assumption on the multicollinearity of the variables is confirmed using the variance inflation factor. Statistics demonstrate that the multicollinearity assumption is satisfied since the VIF satisfies the requirements. Table 4.3, which is seen below, revealed the article's VIF.

Table 4.3 Variance inflation factor (VIF)

	1/VIF	VIF
AAI	0.497	1.527
EG	0.137	1.497
FD	0.258	1.670
FP	0.391	1.839
LNTA	0.62	1

The second presumption regarding the normality of the variables is confirmed using the Skewness and Kurtosis test. Statistics demonstrate that the usual criteria for Skewness and Kurtosis are not met, indicating that the normalcy assumption is not fully satisfied. The article's skewness and kurtosis were revealed in Table 4.4, which is displayed below.

Table 4.4 Skewness and Kurtosis test

Variable	Orbs	Pr (Skewness)	Pr (Kurtosis)	Adj_Chi2(2)	Prob>Chi2
AAI	150	1.231	1.003	4.53	1.632
EG	150	1.305	0	36.45	0
FD	150	0	1.030	17.39	0
FP	150	0	0	53.85	0
LNTA	150	0	0		0

Figure 4.1 depicts the six ASEAN nations' annual economic growth rates from 1995 to 2019. In general, over the course of the study, Cambodia and Vietnam outperformed Indonesia, Malaysia, the Philippines, and Thailand in terms of average yearly economic growth. Both the global financial crisis of 2008–2009 and the Asian financial crisis of 1997–1998, however, had a negative impact on all of the nations.
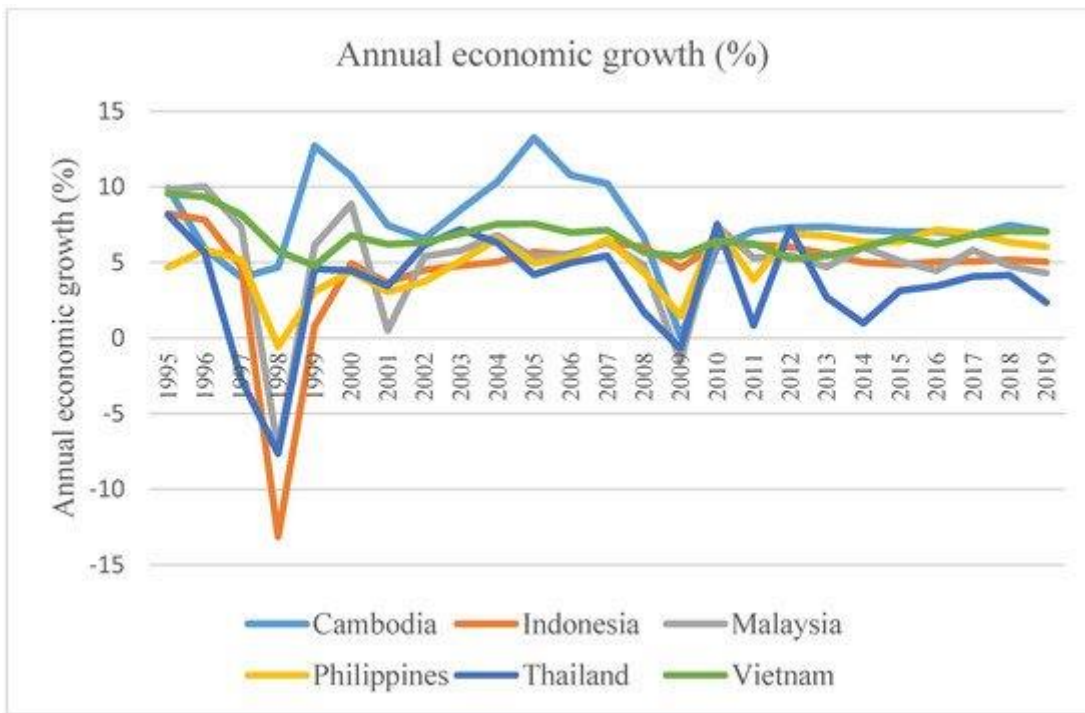
Figure 4.1. The annual economic growth of six ASEAN countries. (Rahman et al.,2022)

5. DISCUSSION

This research showed that the digital transition is not a constant fact. The advantages of digital transformation for business models and the significance of creating a digitization plan are both understood by about 60% of companies. Internationally, the phrase "digital transformation" describes companies and organizations of all sizes, from a multitude of sectors, with numerous of varying requirements, but with one feature in general; the adoption of emerging techniques that signal a defining moment in the concept of innovative business models.

Fully customised marketing to all consumer segments is made possible by AI. AI has the potential to enhance the consumer experience in a multichannel world. Applications include virtual assistants, chatbots, voice bots, and recommender systems. AI assistants can manage a greater number of customer care encounters, retaining customers and operational performance, notably if the interactions are regular. In industrial environments, AI capabilities improve quality control and preventative maintenance. Businesses that excel in the market are those who have strong digital capabilities, a wide adoption of AI technology, and a proactive AI strategy. Technology is a tool; it does not, by itself, lead to higher output. Instead, it must be supplemented by

the identification of pertinent uses, the growth of internal competences, and the application of change management, all of which support the development of flexible work environments and a culture of cooperation.

Even though technological barriers are being removed (albeit slowly) in this environment, there are still obstacles to the use of AI in business, like a dearth of AI-related talent and the typical challenges associated with proving the value of a developing technology.

The proper and ethical implementation of AI, especially in enterprises, is one of the biggest challenges it faces. According to a study, 55% of companies overestimate the level of maturity of their AI-related activities. These programmes are divided into three categories: social and environmental impact reduction, human and ethical AI, and justice and equity.

6. CONCLUSION

The current article's goal is to examine how EG, FD, and FP have affected the adoption of artificial intelligence in ASEAN nations. According to the findings, EG, FD, and FP are positively related to the uptake of artificial intelligence in ASEAN nations. The firms and nations with complete EG, FD, and FP may be able to adopt innovation and artificial intelligence in the workplace, which could

explain these results. As a result, the banking systems in the ASEAN nations have robust EG, FD, and FP, which is why they have implemented artificial intelligence in their systems.

A few of the challenges currently being confronted involve the industry's underfunding in AI, the government sector's vision impairment and deficient digital capacity and flexibility, the business and government sectors' slow adoption of constantly evolving AI technologies, and the rising number of possible AI users.

Governments should build national AI strategies to address these issues, emphasizing the adoption of AI in critical industries while expediting the development of core AI policy frameworks. Governments can also encourage the corporate sector to participate in AI through incentive schemes like financial assistance and the development of secure online environments. Finally, to further speed up the adoption of AI techniques across the private and public sectors, these approaches can be reinforced by the implementation of educational and capacity-building initiatives that introduce an understanding of AI.

7. LIMITATIONS AND FUTURE DIRECTIONS

The current research contains certain restrictions and some recommendations for up-and-coming scholars. Future research should examine other businesses and nations in addition to the banking sector since the conclusions of the current research are only generalized to the banking sector and to the area of ASEAN countries.

REFERENCES

1) United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). 2021. Asia and the Pacific SDG Progress Report 2021. New York: United Nations

2) Galaz, V., Centeno, M. A., Callahan, P. W., Causevic, A., Patterson, T., Brass, I., ... & Levy, K. (2021). Artificial intelligence, systemic risks, and sustainability. Technology in Society, 67, 101741.

3) Nishant, R., Kennedy, M., & Corbett, J. (2020). Artificial intelligence for sustainability: Challenges, opportunities, and a research agenda. International Journal of Information Management, 53, 102104.

4) Pau, J., Baker, J., & Houston, N. (2017). Artificial intelligence in Asia: preparedness and resilience. Asia Business Council (http://www. asiabusinesscouncil. org/Research17_AI. html).

5) Russell, S. J., Norvig, P., Canny, J. F., Malik, J. M., & Edwards, D. D. (2003). Artificial intelligence: a modern approach. vol. 2 Prentice hall. Upper Saddle River.

6) Purdy, M., and Daugherty, P. 2016. "Why Artificial Intelligence Is the Future of Growth," Remarks at AI Now: The Social and Economic Implications of Artificial Intelligence Technologies in the Near Term), pp. 1-72.

7) Soni, N., Sharma, E. K., Singh, N., & Kapoor, A. (2019). Impact of artificial intelligence on businesses: from research, innovation, market deployment to future shifts in business models. arXiv preprint arXiv:1905.02092.

8) Chen, L., Jiang, M., Jia, F., & Liu, G. (2021). Artificial intelligence adoption in business-to-business marketing: toward a conceptual framework. Journal of Business & Industrial Marketing.

9) Jain, P., & Aggarwal, K. (2020). Transforming marketing with artificial intelligence. International Research Journal of Engineering and Technology, 7(7), 3964-3976.

10) Bui, T. H., & Nguyen, V. P. (2022). The Impact of Artificial Intelligence and Digital Economy on Vietnam's Legal System. International Journal for the Semiotics of Law-Revue internationale de Sémiotique juridique, 1-21.

11) Rahman, M. M., Vu, X. B., & Nghiem, S. (2022). Economic Growth in Six ASEAN Countries: Are Energy, Human Capital and

Financial Development Playing Major Roles?. Sustainability, 14(8), 4540.

Financial Development Playing Major Roles?. Sustainability, 14(8), 4540.