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Implications of Tourism Industry Competitiveness on Culinary Industry Revenue and Digital Transactions in ASEAN Countries

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Abstract. The tourism industry serves as a key economic driver across ASEAN countries, yet its broader economic implications beyond direct sectoral contributions remain underexplored. As the region continues its post-pandemic recovery from 2019 to 2024, understanding how tourism competitiveness stimulates related sectors such as the culinary industry and digital economy has become increasingly important for integrated development strategies. This study aims to analyze the implications of tourism industry competitiveness on culinary industry revenue and digital transactions in ASEAN countries. The research employs a quantitative approach using panel data regression analysis. The sample covers 10 ASEAN member countries observed annually from 2019 to 2024, with data sourced from the World Economic Forum's Travel & Tourism Development Index (TTDI), international organizations, and national statistical agencies. The results of the panel data regression indicate that tourism industry competitiveness has a significant and positive effect on both culinary industry revenue and digital transactions across ASEAN countries. These findings suggest that enhanced tourism competitiveness reflected in improved infrastructure, effective policies, and favorable business conditions generates substantial spillover effects that benefit the culinary sector through increased tourist spending on local cuisine, while simultaneously accelerating digital transaction adoption as tourists increasingly utilize online booking platforms, cashless payments, and digital services throughout their travel experiences. The study underscores the strategic role of tourism competitiveness as a catalyst for broader economic transformation, highlighting the importance of integrated policies that leverage tourism growth to strengthen related industries and accelerate digitalization across the ASEAN region.

Keywords: ASEAN; Culinary Industry Revenue; Digital Transactions; Panel Data Regression; Tourism Competitiveness.

1. INTRODUCTION

Over the past five years, the dynamics of ASEAN's tourism industry have been heavily shaped by the post-COVID-19 recovery. Countries such as Thailand, Vietnam, and Indonesia experienced sharp fluctuations in competitiveness (Fitriani, 2023). During the 2022-2024 period, as borders reopened, a phenomenon of "revenge travel" occurred, directly boosting the revenue of the culinary industry. Both international and domestic tourists tended to allocate spending toward local food, making the culinary sector the largest contributor to tourism GDP in countries like Thailand (approximately 30% of tourist expenditure) (Sugianto, 2024).

High competitiveness, supported by cleanliness and the uniqueness of street food, proved capable of driving MSME culinary revenues beyond pre-pandemic levels. Another significant phenomenon is the accelerated adoption of digital payments and food delivery services, driven by the increasing competitiveness of urban tourist destinations. In Singapore, Malaysia, and the Philippines, the integration of tour booking platforms with digital culinary recommendations has transformed tourist spending behavior.

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Digital transactions in the culinary sector no longer occur only in physical restaurants but also through e-wallets and super apps such as Grab and GoTo. Over the past five years, the digital transaction value for the food and beverage (F&B) sector in the ASEAN region is estimated to have more than doubled, driven by tourists' desire to explore local cuisine without distance limitations (Maulidia, 2026).

The competitiveness of ASEAN tourism, which emphasizes payment convenience, has given rise to a "cashless tourism" phenomenon. Countries such as Indonesia (with QRIS) and Thailand (PromptPay) have integrated regional QR code payment standards. This has triggered a significant increase in cross-border digital transaction value, particularly in border tourist destinations (Wibowo, 2025). This phenomenon is clearly visible in areas such as Chiang Rai (Thailand) or Johor (Malaysia), where tourists use neighboring countries' digital wallets to purchase food. Over the past five years, cross-border digital payment transactions in ASEAN for retail and culinary sectors have grown significantly, creating an ecosystem where tourism competitiveness heavily depends on inclusive digital financial infrastructure.

Although tourism competitiveness drives revenue, field observations show that countries with weak culinary supply chain resilience actually experience inflationary pressure. In countries such as Laos or Myanmar, an increase in tourist numbers (competitiveness) does not always correlate with an increase in net revenue for the local culinary industry due to high dependence on imported raw materials. In contrast, Vietnam and Cambodia show a positive phenomenon where increased tourism competitiveness (liberal visa policies) boosts street food revenue while simultaneously increasing digital transaction value through local payment platforms. This proves that over the past five years, synergy between tourism promotion, digital infrastructure, and the local culinary ecosystem has been the key determinant of economic growth in this sector.

Paul Savuriar, Manager for Business Development for APAC at GlobalData Plc, highlights how changing tourism patterns directly impact culinary industry revenue. He emphasizes that a decline in tourists from certain regions, such as the Middle East, places significant pressure on the Quick Service Restaurant (QSR) sector in countries like Malaysia. According to him, the resulting gap caused by these fluctuations forces business operators to adapt. His view underscores that unstable tourism competitiveness requires mitigation strategies, where digitalization becomes the key. Savuriar asserts that operators who leverage digital platforms and delivery services can maintain engagement with local consumers when international demand is weak (Savuriar, 2026).

As the Head of the Representative Office of Bank Indonesia for West Sumatra Province, Mohamad Abdul Majid Ikram provides a perspective based on real data regarding the impact of cross-border digital payment system integration on culinary revenue. He revealed that ease of transactions through the Quick Response Code Indonesian Standard (QRIS) directly encourages increased spending by foreign tourists (Azizah, 2026). During the period from January to July 2025, the transaction value of Malaysian tourists using QRIS in West Sumatra reached IDR 14.1 billion. More specifically, Ikram noted that approximately 60% of these digital transactions occurred in the culinary sector, particularly at local MSMEs. His perspective proves that tourism competitiveness supported by inclusive digital payment infrastructure will automatically boost culinary industry revenue (Ikram, 2025).

Rajesvare Rada, a PATA Expert and Senior Lecturer at HELP University Malaysia, highlights another side of digital transformation: the challenge of the digital divide. At the ASEAN AIFTIS 2025 forum, she explained that although AI and machine learning can drive tourist experience personalization and revenue optimization, their implementation is uneven. Rajesvare emphasizes that the lack of equal access to advanced technology and infrastructure is a major barrier, especially for Small and Medium Enterprises (SMEs) in ASEAN. Her critical perspective shows that without equitable digital governance standards, tourism competitiveness can actually widen gaps and hinder the revenue potential of smaller, non-digitalized culinary businesses (Rada, 2025).

A comprehensive report from Mordor Intelligence, representing industry analysts' perspectives, quantitatively proves the close relationship between tourism and cuisine. According to their data, tourism recovery has driven an increase in food and beverage spending by international tourists of up to 180% between 2022 and 2024 . These analysts emphasize that integration between hospitality and food services has transformed business models. Hotels have shifted from merely providing room service to creating premium dining experiences that increase revenue. This perspective reinforces the fact that investment in tourism competitiveness, particularly through improving service quality and digital integration, yields significant returns for culinary industry revenue across the ASEAN region (Mordor Intelligence., 2023).

Research on the relationship between tourism competitiveness, the culinary industry, and digitalization has indeed begun to receive academic attention, although it remains limited to specific regional contexts. One relevant early study was conducted by (Denpaiboon, 2019), who analyzed Thailand's competitiveness as an ASEAN gastronomic tourism hub using Porter's Diamond Model.

This study successfully mapped Thailand's culinary potential in attracting tourists, but it had limitations because it focused only on one country and did not address the role of digital transactions, which were not yet widespread at the time. In other words, this study laid an important foundation regarding the significance of gastronomy in tourism competitiveness, but it did not answer how digital technology could strengthen this relationship.

As technology developed, a number of researchers began shifting their attention to the role of digitalization in the tourism and hospitality industry. (Bogomazova, I. V., Anoprieva, E. V., & Klimova, 2019) as well as Ustinova and (Ustinova, N. G. & Shevchenko, 2019) separately examined the trends and prospects of the digital economy in the tourism and hospitality sectors. Both studies agreed that digitalization has fundamentally transformed the industrial landscape, yet their focus remained very general and they did not specifically measure its impact on culinary industry revenue. Meanwhile, (Pastukhova, 2019) discussed digital technology as a driver for the development of tourism enterprises, albeit in the context of accessible tourism in Russia, so its relevance to mass tourism and culinary tourism in ASEAN remains limited.

More specific research on the impact of digitalization on the food and hospitality industries was conducted by the (Kazakh Cooperative Institute, 2024), which analyzed how tourism digitalization affects the food industry, hospitality, and the consumer goods market. This study provided evidence that digital transformation can drive efficiency and revenue, but once again its geographical context is Russia (the Republic of Tatarstan), not the ASEAN region, which has different economic and cultural characteristics. Similarly, (Oborin, 2022), in his study on the digital transformation of tourism space, identified various new features emerging from digitalization, but did not explicitly examine the relationship between tourism competitiveness and culinary revenue or digital transaction value.

From these six previous studies, it is clear that a significant research gap still exists. Geographically, the majority of studies are set in Russian orEuropean contexts, while only one study (Denpaiboon, 2019), touches on ASEAN, yet it is nearly a decade old. Thematically, these studies tend to discuss tourism digitalization and the culinary industry separately; none have integrated the three main variables: tourism competitiveness as an independent variable, along with culinary industry revenue and digital transaction value as dependent variables. Methodologically, most are qualitative or conceptual in nature, with few conducting quantitative measurements of correlations or causalities between variables.

Therefore, this research aims to fill that gap by quantitatively and comparatively examining the impact of tourism competitiveness on culinary industry revenue and digital transaction value in ASEAN countries, while also adding the mediating role of cross-border digital payment infrastructure, which has never been studied before.

2. METHODOLOGY

This study adopts an explanatory research design aimed at examining the causal relationship between the competitiveness of the tourism industry and its impact on culinary industry revenue and digital transaction value in ASEAN countries. Explanatory research is chosen because it seeks to explain the patterns of influence between independent and dependent variables, rather than merely describing phenomena. In this context, the independent variable is the tourism industry competitiveness (measured through indicators travel and tourism development index scores), while the dependent variables are culinary industry revenue (measured by the contribution of the food and beverage sector to national GDP or total sales of culinary MSMEs) and digital transaction value (measured by the volume or value of digital payments, e-wallet transactions, and food delivery platform transactions). The study also considers the role of cross-border digital payment infrastructure as a mediating variable, reflecting the novelty of this research compared to previous studies that largely ignored this aspect.

The population of this study includes all ten ASEAN member states, namely Indonesia, Malaysia, Thailand, Singapore, Philippines, Vietnam, Brunei Darussalam, Myanmar, Laos, and Cambodia. The sample is determined using a total sampling or census technique, meaning that all ten countries are included as research samples. The observation period spans six consecutive years, from 2019 to 2024. This period is deliberately chosen because it captures critical dynamics in tourism and digitalization, including the pre-pandemic year (2019), the peak of the COVID-19 crisis (2020-2021), the post-pandemic recovery phase (2022-2023), and the period of digital acceleration and cross-border payment integration (2024). The use of panel data, which combines cross-sectional data (ten countries) and time-series data (six years), yields a total of 60 observational units (10 countries × 6 years). Panel data is highly suitable for this study because it allows the researcher to control for unobserved country-specific heterogeneity, capture dynamic changes over time, and provide more efficient estimates compared to pure cross-sectional or pure time-series analysis.

The data required for this study consist of secondary data obtained from authoritative international institutions. Sources include the World Bank Open Data (for tourism expenditure and digital infrastructure indicators), the United Nations World Tourism Organization (UNWTO) (for international tourist arrivals and tourism competitiveness indices), the ASEAN Secretariat (for regional digital economy reports), and Statista as well as Mordor Intelligence (for digital transaction values in the food and beverage sector). Additionally, country-level data from central banks (e.g., Bank Indonesia, Bank of Thailand, Bangko Sentral ng Pilipinas) regarding cross-border QR payment volumes will be utilized where available. All data will be collected in annual frequency to match the 2019-2024 observation window.

The analytical technique employed is panel data regression, using software Eviews 13. The general model specification is as follows:

$$Yit=\alpha+1X1it+2X2it+3Mit+it \quad \dots (i)$$

Where:

- Yit = culinary industry revenue / digital transaction value for country i in year t
- X1it = tourism competitiveness (tourist arrivals)
- X2it = tourism competitiveness (T&T Development Index)
- Mit = cross-border digital payment infrastructure (dummy or volume)
- it = error term

To determine the most appropriate model among Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM), the study will conduct three diagnostic tests: the Chow test (to choose between CEM and FEM), the Hausman test (to choose between FEM and REM). Once the best model is selected, hypothesis testing will be performed using the t-test (partial effect) and the coefficient of determination (R2) to measure the explanatory power of the independent variables on the dependent variables.

This methodological framework ensures that the study not only fills the research gap identified in previous literature but also provides rigorous, quantitative evidence on the implications of tourism industry competitiveness on culinary industry revenue and digital transactions across all ASEAN countries from 2019 to 2024.

3. RESULT AND DISCUSSION

The Impact of Tourism Industry Competitiveness on Culinary Industry

Table 1. Chow Test Model 1.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	17.184502	(4,30)	0.0000
Cross-section Chi-square	47.650903	4	0.0000

Source: Data Processed by EViews 13.

The Chow test results presented in the table aim to select the most appropriate panel data estimation model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM). This test is conducted to determine whether cross-section fixed effects collectively have a significant influence on the model. Based on the output above, the Cross-section F-value is 17.184502 with degrees of freedom (4, 30) and a probability value of 0.0000. Meanwhile, the Cross-section Chi-square value is 47.650903 with 4 degrees of freedom and a probability value also of 0.0000.

The decision rule in the Chow test is as follows: if the probability value (p-value) is less than the significance level ($\alpha = 0.05$ or 5%), then H0 is rejected, meaning that the appropriate model is the Fixed Effect Model (FEM). Conversely, if the probability value is greater than 0.05, then H0 is accepted, meaning that the Common Effect Model (CEM) is the appropriate model. In these results, both the F-test and the Chi-square test show probability values of 0.0000, which are far smaller than 0.05.

Therefore, H0, which states that there are no cross-section fixed effects, is rejected. In conclusion, the Fixed Effect Model (FEM) is more appropriate to use than the Common Effect Model (CEM) in analyzing the impact of tourism industry competitiveness on culinary industry revenue in ASEAN countries. This indicates that each ASEAN country has specific and distinct characteristics that cannot be ignored. By using FEM, the regression model is able to control for cross-country heterogeneity, thereby producing more accurate and unbiased estimates. Furthermore, after FEM is selected, a subsequent test, namely the Hausman Test, is required to compare FEM with the Random Effect Model (REM) in order to determine the most efficient final model.

Table 2. Hausman Test Model 1.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.727328	1	0.0006

Source: Data Processed by EViews 13.

The Hausman test results presented in the table aim to select the most appropriate panel data estimation model between the Fixed Effect Model (FEM) and the Random Effect Model (REM). This test is conducted to determine whether there is a correlation between individual effects (cross-section random effects) and the independent variables in the model. Based on the output above, the Chi-Square Statistic value is 11.727328 with 1 degree of freedom (Chi-Sq. d.f.) and a probability value of 0.0006.

The decision rule in the Hausman test is as follows: if the probability value (p-value) is less than the significance level ($\alpha = 0.05$ or 5%), then H0 is rejected, meaning that the appropriate model is the Fixed Effect Model (FEM). Conversely, if the probability value is greater than 0.05, then H0 is accepted, meaning that the Random Effect Model (REM) is the appropriate model. In these results, the probability value of 0.0006 is far smaller than 0.05, so H0 is rejected.

Therefore, the Fixed Effect Model (FEM) is more appropriate to use than the Random Effect Model (REM) in analyzing the impact of tourism industry competitiveness on culinary industry revenue in ASEAN countries. This result indicates that there is a significant correlation between the specific effects of each country (individual heterogeneity) and the independent variables in the model. In other words, the unique characteristics of each ASEAN country systematically influence the relationship between tourism competitiveness and culinary industry revenue. Consequently, the use of FEM allows the model to control for this heterogeneity, thereby producing unbiased and consistent estimates.

Table 3. Fixed Effect Model 1.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1975.548	13.13124	150.4464	0.0000
COMPETITIVENESS	2.027666	0.579348	3.499911	0.0010
R-squared	0.699992	Prob(F-statistic)	0.000000	
Adjusted R-squared	0.636725	Durbin-Watson	1.755291	

Source: Data Processed by EViews 13.

The panel data regression estimation results using the Fixed Effect Model (FEM) show the effect of the tourism industry competitiveness variable (Competitiveness) on culinary industry revenue (Culinary Revenue) in ASEAN countries. Based on the output above, the resulting regression equation is: Culinary Revenue = 1975.548 + 2.027666 (Competitiveness). The constant value (C) of 1975.548 indicates that if the tourism industry competitiveness variable is zero, then culinary industry revenue in ASEAN countries is estimated to remain at 1975.548 (in the appropriate unit, such as million US dollars or locally standardized currency).

The probability value of the constant is 0.0000, which is statistically significant ($p < 0.05$), indicating that the constant has meaningful interpretation within the model. The tourism industry competitiveness variable (Competitiveness) has a coefficient of 2.027666 with a t-Statistic value of 3.499911 and a probability value of 0.0010. Since this probability value is smaller than the significance level of 0.05, it can be concluded that the tourism industry competitiveness variable has a positive and significant effect on culinary industry revenue in ASEAN countries.

The interpretation of this coefficient is that every one-unit increase in the tourism industry competitiveness index (for example, an increase in the score of the Travel and Tourism Development Index or an increase in the number of international tourist arrivals) will lead to an increase in culinary industry revenue of 2.027666 units, assuming other variables remain constant (ceteris paribus). This finding empirically supports the previously described phenomenon that the more competitive a country is in attracting tourists, the greater the revenue obtained by the local culinary sector, whether through direct food spending or digital food delivery services.

In terms of goodness of fit, the R-squared value of 0.699992 or approximately 70% indicates that the tourism industry competitiveness variable is able to explain 70% of the variation in culinary industry revenue, while the remaining 30% is explained by other variables outside the model (such as the level of digital payment adoption, transportation infrastructure, tax policies, or consumer preferences).

The Adjusted R-squared value of 0.636725 (approximately 63.7%) is the R-squared value that has been adjusted for the number of independent variables and degrees of freedom, and is still considered relatively high for a model with one independent variable. The Prob(F-statistic) value of 0.000000 (or 0.0000), which is far below 0.05, indicates that the regression model as a whole (simultaneously) is significant and suitable for predicting the relationship between tourism competitiveness and culinary revenue.

Meanwhile, the Durbin-Watson statistic value of 1.755291 is around 2 (within the acceptable range of 1.5 to 2.5), which indicates that there is no serious autocorrelation problem in the model's residuals. Thus, this FEM model can be relied upon to conclude that an increase in tourism industry competitiveness significantly drives an increase in culinary industry revenue in the ASEAN region during the observation period.

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Table 4. Chow Test Model 2.

Effects Test	Statistic	d.f.	Prob.
Cross-section F	70.855656	(9,49)	0.0000
Cross-section Chi-square	158.404712	9	0.0000

Source: Data Processed by EViews 13.

The Chow test results presented in Table 3.4 aim to select the most appropriate panel data estimation model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) for examining the impact of tourism industry competitiveness on digital transactions in ASEAN countries. This test is conducted to determine whether cross-section fixed effects collectively have a significant influence on the model. Based on the output above, the Cross-section F value is 70.855656 with degrees of freedom (9, 49) and a probability value of 0.0000. Meanwhile, the Cross-section Chi-square value is 158.404712 with 9 degrees of freedom and a probability value also of 0.0000.

The decision rule in the Chow test is as follows: if the probability value (p-value) is less than the significance level ($\alpha = 0.05$ or 5%), then H0 is rejected, meaning that the appropriate model is the Fixed Effect Model (FEM). Conversely, if the probability value is greater than 0.05, then H0 is accepted, meaning that the Common Effect Model (CEM) is the appropriate model. In these results, both the F-test and the Chi-square test show probability values of 0.0000, which are far smaller than 0.05.

Therefore, H0, which states that there are no cross-section fixed effects, is rejected. In conclusion, the Fixed Effect Model (FEM) is more appropriate to use than the Common Effect Model (CEM) in analyzing the impact of tourism industry competitiveness on digital transactions in ASEAN countries. This indicates that each ASEAN country has specific and distinct characteristics that cannot be ignored in the model, such as the level of internet penetration, e-wallet adoption, cross-border payment policies (e.g., QRIS, PromptPay, DuitNow), telecommunications infrastructure, and the level of digital literacy among the population.

By using FEM, the regression model is able to control for cross-country heterogeneity, thereby producing more accurate and unbiased estimates. The very high-test statistic values (Cross-section F of 70.86 and Cross-section Chi-square of 158.40) indicate that the differences in characteristics among ASEAN countries are very strong and significant in influencing the relationship between tourism competitiveness and digital transactions.

Furthermore, after FEM is selected, a subsequent test, namely the Hausman Test, is required to compare FEM with the Random Effect Model (REM) in order to determine the most efficient final model for Model 2.

Table 5. Hausman Test Model 2.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	637.700903	1	0.0000

Source: Data Processed by EViews 13.

The Hausman test results presented in Table 3.5 aim to select the most appropriate panel data estimation model between the Fixed Effect Model (FEM) and the Random Effect Model (REM) for examining the impact of tourism industry competitiveness on digital transactions in ASEAN countries. This test is conducted to determine whether there is a correlation between individual effects (cross-section random effects) and the independent variable in the model. Based on the output above, the Chi-Square Statistic value is 637.700903 with 1 degree of freedom (Chi-Sq. d.f.) and a probability value of 0.0000.

The decision rule in the Hausman test is as follows: if the probability value (p-value) is less than the significance level ($\alpha = 0.05$ or 5%), then H0 is rejected, meaning that the appropriate model is the Fixed Effect Model (FEM). Conversely, if the probability value is greater than 0.05, then H0 is accepted, meaning that the Random Effect Model (REM) is the appropriate model. In these results, the probability value of 0.0000 is far smaller than 0.05, so H0 is rejected.

Therefore, the Fixed Effect Model (FEM) is more appropriate to use than the Random Effect Model (REM) in analyzing the impact of tourism industry competitiveness on digital transactions in ASEAN countries. This result indicates that there is a very significant correlation between the specific effects of each country (individual heterogeneity) and the independent variable in the model. The very high Chi-Square statistic value of 637.70 indicates that differences in characteristics among ASEAN countries such as the level of internet penetration, e-wallet adoption, availability of cross-border payment infrastructure (QRIS, PromptPay, DuitNow), digital banking regulations, and the level of digital literacy among the population have a very strong influence on the relationship between tourism competitiveness and digital transactions. In other words, the unique characteristics of each country systematically influence the extent to which an increase in tourism competitiveness can drive an increase in digital transaction value. Consequently, the use of FEM allows the model to control for this heterogeneity, thereby producing unbiased and consistent estimates.

Table 6. Fixed Effect Model 2.

DEPENDEN VARIABLE DIGITAL TRANSACTIONS				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
c	1962.772	2.151068	912.4641	0.0000
COMPETITIVENESS	2.335561	0.085512	27.31261	0.0000
R-squared	**0.938363**	**Prob(F-statistic)**	**0.000000**	
Adjusted R-squared	**0.925784**	**Durbin-Watson**	**1.786231**	

Source: Data Processed by Eviews 13.

The panel data regression estimation results using the Fixed Effect Model (FEM) show the effect of the tourism industry competitiveness variable (Competitiveness) on digital transactions (Digital Transactions) in ASEAN countries. Based on the output in Table 3.6 above, the resulting regression equation is: Digital Transactions = 1962.772 + 2.335561 (Competitiveness). The constant value (C) of 1962.772 indicates that if the tourism industry competitiveness variable is zero, then the digital transaction value in ASEAN countries is estimated to remain at 1962.772 (in the appropriate unit, such as million US dollars or billions of rupiah). The probability value of the constant is 0.0000, which is statistically significant ($p < 0.05$), indicating that the constant has meaningful importance in the model.

The tourism industry competitiveness variable (Competitiveness) has a coefficient of 2.335561 with a t-Statistic value of 27.31261 and a probability value of 0.0000. Since this probability value is far smaller than the significance level of 0.05, it can be concluded that the tourism industry competitiveness variable has a positive and significant effect on digital transactions in ASEAN countries. The interpretation of this coefficient is that every one-unit increase in the tourism industry competitiveness index (for example, an increase in the score of the Travel and Tourism Development Index or an increase in the number of international tourist arrivals) will lead to an increase in digital transaction value of 2.335561 units, assuming other variables remain constant (ceteris paribus).

This finding empirically supports the phenomenon that the more competitive a country is in attracting tourists, the greater the volume or value of digital transactions that occur, particularly those related to culinary payments, online transportation, tourism tickets, and local product purchases through digital platforms. The very high t-Statistic value (27.31) indicates that the influence of the competitiveness variable on digital transactions is statistically very strong.

In terms of goodness of fit, the R-squared value of 0.938363 or approximately 93.8% indicates that the tourism industry competitiveness variable is able to explain 93.8% of the variation in digital transactions, while the remaining 6.2% is explained by other variables outside the model (such as the level of internet penetration, digital payment policies, economic growth, or consumer preferences for cashless transactions). The Adjusted R-squared value of 0.925784 (approximately 92.6%) is the R-squared value that has been adjusted for the number of independent variables and degrees of freedom.

This value is considered very high for a model with one independent variable, indicating that the model has excellent predictive capability. The Prob (F-statistic) value of 0.000000 (0.0000), which is far below 0.05, indicates that the regression model as a whole (simultaneously) is significant and suitable for predicting the relationship between tourism competitiveness and digital transactions. Meanwhile, the Durbin-Watson statistic value of 1.786231 is around 2 (within the acceptable range of 1.5 to 2.5), which indicates that there is no serious autocorrelation problem in the model's residuals.

Thus, this FEM model for digital transactions is highly reliable for concluding that an increase in tourism industry competitiveness significantly and very strongly drives an increase in digital transaction value in the ASEAN region during the observation period. Furthermore, when compared to the previous model using culinary industry revenue as the dependent variable (R-squared = 0.70), this digital transactions model has a much higher explanatory power (R-squared = 0.94), indicating that digital transactions are more responsive to increases in tourism competitiveness than culinary revenue directly.

4. CONCLUSION

The following conclusions can be drawn from the research findings that the panel data regression analysis using the Fixed Effect Model (FEM) proves that tourism industry competitiveness has a positive and significant effect on both culinary industry revenue and digital transactions in ASEAN countries during the 2019-2024 period. In Model 1 (culinary revenue), the tourism competitiveness variable has a coefficient of 2.027666 with a probability of 0.0010 ($p < 0.05$) and an R-squared value of 0.699992 (70%). This means that every one-unit increase in the tourism competitiveness index will increase culinary industry revenue by 2.03 units, with the independent variable explaining 70% of the variation in culinary revenue.

In Model 2 (digital transactions), the effect found is much stronger, with a coefficient of 2.335561, a probability of 0.0000 ($p < 0.05$), and an R-squared value of 0.938363 (93.8%). This means that every one-unit increase in tourism competitiveness drives an increase in digital transactions of 2.34 units, and this model is able to explain nearly 94% of the variation in digital transactions.

Scientifically, these findings confirm the theory that an increase in tourist arrivals (as a proxy for tourism competitiveness) creates a multiplier effect on the local economy, particularly in the culinary sector and digital payment ecosystems. The main argument is that tourists, both domestic and international, tend to spend most of their budget on food and beverage consumption, which is increasingly facilitated by cross-border digital transaction conveniences such as QRIS, PromptPay, and DuitNow. More interestingly, these findings show that digital transactions have higher responsiveness (coefficient of 2.34 vs 2.03; R-squared of 93.8% vs 70%) compared to direct culinary revenue in response to increased tourism competitiveness.

This can be scientifically explained because digital transactions not only cover culinary payments but also the entire modern tourism ecosystem (online transportation, attraction tickets, local product shopping, and food delivery services), so that an increase in tourists provides a broader and more measurable impact on digital transaction value. Thus, investment in improving tourism competitiveness (for example, through visa policies, destination promotion, and digital infrastructure) will have a greater and faster impact on ASEAN's digital economic growth compared to only direct culinary revenue.

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AUTHORS' CONTRIBUTION

Author 1: Conceptualization, project management, validation, and writing, including editing and review.

Author 2: Investigation, data curation, and conceptualization.

Author 3: Data curation; Investigation.

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