Macroeconomic Indicators and Crime Rate on Malaysia Tourism Receipts

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ABSTRACT

Since Malaysia's tourist receipts have been steadily rising over time, it is imperative to examine the economic factors that most significantly affect these receipts. In this study, 25 annual observations from 1996 to 2021 are used to investigate the relationship between Malaysia's Tourism Receipts (MTR) and the Exchange Rate (ER), Gross Domestic Product (GDP), Malaysia's Unemployment Rate (MU), Inflation Rate (IR), and Crime Rate (CR) through Multiple Linear Regression analysis using the Ordinary Least Squares (OLS) method. It is postulated that the selected macroeconomic factors influence Malaysia's tourism receipts. The findings indicate that GDP, and exchange rate, have a positive significant relationship with tourism receipts, whereas unemployment has a negative significant relationship with tourism receipts.

Keywords— Tourism Receipts; Ordinary Least Square; Multiple Linear Regression; Macroeconomics Determinants; Malaysia

INTRODUCTION

The tourism sector in Malaysia has grown to become the backbone of the nation's economy, contributing significantly to its overall expansion and development. Over the years, Malaysia has emerged as a diverse and popular tourism destination, attracting visitors from across the globe. The growth of the tourism industry has not only made Malaysia a preferred destination for both domestic and international travelers but has also established the sector as a vital driver of the nation's economic progress. With its rich multicultural heritage, breathtaking natural landscapes, vibrant cities, and cultural treasures, Malaysia offers year-round tourism opportunities due to its pleasant climate, making it an attractive destination throughout the year. These attributes have secured Malaysia a prominent place in the international travel market.

In Malaysia, more than 3.6 million citizens are employed in the tourism industry, accounting for 23.6% of the total workforce [14]. This underscores the sector's importance to Malaysians and their economic well-being. Sustained growth in the tourism sector has the potential to make a substantial contribution to Malaysia's Gross Domestic Product (GDP). In turn, the creation of additional job opportunities can lead to improved living standards for Malaysians.

This study considers several factors that may influence tourism receipts. The independent variables examined include inflation, exchange rate, Gross Domestic Product (GDP), unemployment rate, and crime rate.

The growth and sustainability of Malaysia's tourism industry depend on a complex interplay of these factors, each shaping the country's appeal as a destination. Exchange rates affect the affordability of international travel; GDP reflects overall economic performance and influences tourism trends; inflation impacts tourists' purchasing power; unemployment signals shifts in domestic and international tourism demand; and crime rates directly affect tourists' perceptions of safety. Collectively, these macroeconomic indicators serve as critical measures for

assessing the broader economic environment in which Malaysia's tourism industry operates, shaping its long-term trajectory.

Understanding the relationship between these macroeconomic factors and tourism receipts is crucial for ensuring the sector's growth and sustainability. The Malaysian tourism industry is fundamentally intertwined with the nation's broader economic landscape. By examining how these variables influence tourism receipts, governments, industry stakeholders, and businesses can make more informed decisions. To address this gap, this study investigates the relationship between tourism receipts and the exchange rate (ER), Gross Domestic Product (GDP), Malaysia's unemployment rate (MU), inflation rate (IR), and crime rate (CR) through Multiple Linear Regression analysis using the Ordinary Least Squares (OLS) method.

LITERATURE REVIEW

Since tourism is one of the most effective instruments for economic expansion, it is regarded as crucial to the growth of developing nations [12]. Due to its tropical climate, Malaysia is a year-round destination. Its greatest strength lies in its beaches and islands, which offer year-round sunshine, cultural diversity, and hospitable people [8]. Malaysia provides a wide variety of distinct tourism experiences, including beaches, cities, cultural and heritage attractions, rainforests, food, resorts, health tourism, business, and shopping. Tourists are drawn to the nation's wildlife, natural beauty, forests, and beaches, as highlighted by the historical development of tourism in the [9].

Based on theoretical findings in the literature, several theories explain the relationship between tourism receipts and macroeconomic indicators. Baumol's Cost Disease, developed by William J. Baumol and William G. Bowen in the 1960s, posits that sectors such as education and tourism, despite prudent cost management, experience rising costs. This concept is particularly relevant to labor-intensive industries like tourism, where technological advancements do not significantly improve productivity but instead contribute to cost escalation [7]. Originally applied to the performing arts, Baumol's theory highlights the challenges of increasing service costs, especially in sectors where productivity gains are less attainable compared to manufacturing.

One of the key elements influencing demand for tourism is the exchange rate (ER). Fluctuations in exchange rates can affect travelers' preferences for certain destinations, while variations in exchange rates also influence the cost of foreign travel and the performance of a nation's tourism sector [3]. Overall, these findings suggest a negative relationship between tourism receipts and the exchange rate. However, there is a positive relationship between the real exchange rate and GDP, and both international tourism receipts and economic growth in Algeria during the period 1995–2017 [1].

Another important factor is the crime rate (CR). An increase in crime rates can reduce Malaysian tourism receipts, reflecting a negative relationship [9]. Crime directly impacts the tourism sector, as it influences tourists' perceptions of safety, and the relationship between Malaysia's tourism receipts and crime rates has broader economic implications [11]. However, evidence also indicates a positive relationship between GDP growth and tourism receipts, since economic expansion enables investment in infrastructure such as hotels, airports, and attractions that enhance a country's appeal [2].

In relation to Malaysia's unemployment rate (MU), trends in tourism have been shown to affect unemployment levels. A decline in tourism receipts generally increases unemployment, whereas growth in tourist arrivals creates wider job opportunities, indicating a negative relationship between tourism receipts and unemployment [6].

The inflation rate (IR) is another factor considered in literature. Inflation has been identified as a macroeconomic determinant of tourism receipts [5]. It can be categorized into cost-push, demand-pull, and monetary inflation, driven respectively by rising labor costs, consumer demand, or money supply growth. Both anticipated and unanticipated inflation influence tourism receipts: anticipated inflation reduces willingness to hold cash as currency value declines, while unanticipated inflation more severely erodes purchasing power and increases living expenses. Overall, this suggests a negative relationship between inflation and Malaysia's tourism receipts.

Research Design

This study's research methodology is centered on quantitative analysis and time series econometrics. In quantitative research, numerical data is gathered and analyzed to spot trends, formulate hypotheses, verify cause-and-effect relationships, and extrapolate results to larger groups of people. In contrast, time series econometrics tracks a dataset throughout time to identify the variables' influencing elements at various time points. It is crucial for researching the long-term changes in securities, assets, or economic indicators.

The next goal of this research is to ascertain the cause-and-effect relationship between the independent variables, exchange rate (ER), crime rate (CR), GDP, Malaysia unemployment (MU), and inflation rate (IR), and the dependent variable, Malaysia Tourism Receipts (MTR). A causal research or hypothesis-testing strategy will be used to accomplish this. Making sure that all the assumptions are met is crucial when utilizing Ordinary Least Squares (OLS) to generate a multiple linear regression model. This entails using appropriate statistical methods and procedures to verify that the link between independent and dependent variables is legitimate.

The Model

The method adopted is the Ordinary Least Squares (OLS), a statistical technique employed in linear regression models to estimate the unknown parameters. The left side of the equation was assigned to the dependent variable, the Malaysia Tourism Receipt (MTR). The independent variables on the right side of the equation were specified to be the exchange rate (ER), crime rate (CR), and gross domestic product per capita (GDP). Two additional macroeconomic factors, such as the Malaysian Unemployment Rate (MU) and the Inflation Rate (IR), were included to meet the objectives. These were chosen based on theoretical presumptions made by earlier research. Therefore, the following is the derivation of the econometric model for this study:

$$MTR = \beta_0 + \beta_1 ER + \beta_2 CR + \beta_3 LGDP + \beta_4 MU + \beta_5 IR + e \quad (1)$$

Where, MTR is Malaysia Tourism Receipts in a year; β_0 is a constant term; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ is coefficients to be estimated; ER is Exchange Rate (average in USD), CR is Crime Rate in percentage (%), LGDP Gross domestic product per capita (million USD), MU is Malaysia Unemployment rate in percentage (%), IR Inflation in percentage (%) and e is residual or error term.

Data Description

Secondary data is obtained from external sources to analyze the relationship between the independent variables of exchange rate (ER), crime rate (CR), gross domestic product (GDP), Malaysia unemployment (MU), and inflation (IR) and the dependent variable in this study, Malaysia tourism receipts (MTR).

The sources used to gather and compile the data were from Macrotrends and World Bank (Table 1). There are 25 observations altogether that were collected in the Malaysia time frame between 1996 and 2021. This study's units are percentages and US dollars. To address the study issue and achieve the objectives, the data is analyzed using the Eviews 12 programme, and several additional tests are conducted.

TABLE 1 Operationalisation Of The Indicatorshere's Your Data Converted Into A Clean Table:

Variables	Abb	Description (Unit measurement)	Sources
Malaysia Tourism Receipts	MTR	The total Malaysia tourism receipts in a year	Macrotrends
Exchange Rate	ER	Malaysia's exchange rate (average in USD)	World Bank
Crime Rate	CR	Malaysia's crime rate in percentage (%)	Macrotrends
Gross Domestic Product Per	GDP	The gross domestic product per capita	International Monetary

Capita		(million USD)	Fund (IMF)
Malaysia Unemployment	MU	The Malaysia unemployment rate in percentage (%)	Macrotrends
Inflation Rate	IR	Malaysia's inflation rate in percentage (%)	World Bank

In summary, the diagnostic testing yielded results for normality, autocorrelation, multicollinearity, and heteroskedasticity. The tests were administered using the Variance Inflation Factor (VIF), Jarque Bera Test, Durbin Watson Test, Breusch Godfrey LM Test, and White Test, in that order. It was first carried out to make sure a precisely defined model could be created.

ANALYSIS AND FINDINGS

Table 2 Result Of Normality Test

Variable	Normality Test
Skewness	-0.663400
Kurtosis	2.489665
Jarque-Bera	2.189243
Prob (Jarque-Bera)	0.334666

First, the model residuals were subjected to a normality test. The results of the Normality Test show that the kurtosis value is 2.489665, which is near to 3, and the skewness value is -0.663400, which approximates to zero, as shown in Table 2. The results indicate that the distribution is almost normal, as indicated by the skewness and kurtosis values being in close approximation to the predicted values of a normal distribution. In addition, the Jarque-Bera probability exceeds the significance level of 5%, at 0.334666. Therefore, the null hypothesis cannot be rejected.

Second, the autocorrelation problems of the residuals at first and second order were analyzed using the Durbin-Watson test and the Breusch-Godfrey Serial Correlation LM test, respectively. Using EViews to perform the Durbin-Watson (DW) Test yields a computed d value of 1.325411, as shown in Table 4.

To determine whether serial correlation exists, the Breusch-Godfrey Serial Correlation LM test was then performed. The outcome was a probability value of 0.2747 for the Chi-Square (Appendix ii), which was higher than the 5% level of significance and therefore not significant. Therefore, there was no serial correlation at the second residual order. Stated differently, the residual either lacked cross-temporal correlation or was dispersed randomly. As a result, the presumption that there is no serial link was upheld.

Table 3 Result Of Correlation Analysis

Variable	MTR (Total)	LGDP (USD)	IR (%)	ER (USD)	CR (%)	MU (%)
MTR	1.000000	0.669030	-0.044684	0.137982	-0.396354	-0.139165
LGDP	0.669030	1.000000	-0.192772	0.057382	-0.779451	0.155891
IR	-0.044684	-0.192772	1.000000	-0.268741	0.422916	-0.458855
ER	0.137982	0.057382	-0.268741	1.000000	-0.466342	0.683124

| CR | -0.396354 | -0.779451 | 0.422916 | -0.466342 | 1.000000 | -0.456846 |
| MU | -0.139165 | 0.155891 | -0.458855 | 0.683124 | -0.456846 | 1.000000 |

*Significant at 5% critical value

Correlation analysis was employed in the third test, which was a Multicollinearity test. The variables MTR and ER at 0.137982, MU and LGDP at 0.155891, and ER and LGDP at 0.057382 have weak positive correlations since the probability is less than 0.25, as can be shown in Table 3 above. Meanwhile, there were weak negative correlations for the corresponding variables of IR and MTR at -0.044684, MU and MTR at -0.139165, as well as IR and LGDP at -0.192772 that indicate less than 0.25 disregarding the negative sign.

On the other hand, there exists moderate positive correlation for variables LGDP and MTR at 0.669030, CR and IR at 0.422916, as well as MU and IR at 0.683124 since the probability value falls between 0.25 and 0.75. Meanwhile, there are moderate negative correlation between variables CR and MTR at -0.396354, CR and LGDP at -0.779451, ER and IR at -0.268741, MU and IR at -0.458855, CR and ER at -0.466342 as well as MU and CR at -0.456846 which indicate the value falls between 0.25 and 0.75 disregarding the negative sign. However, there is no strong correlation for any of the variables implying that there is no severe multicollinearity problem to occur.

Table 4 Result Of Multiple Linear Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	-886786.8	179084.9	-4.951769	0.0001
GDP	93686.52	15457.29	5.996299	0.0000
MU	-42882.75	11364.57	-3.773373	0.0012
IR	-3973.902	2690.584	−1.476966	0.1553
ER	50225.84	11174.25	4.494784	0.0002
CR	38698.37	12567.70	3.079192	0.0059
R-squared	0.759690	Mean dependent var		41393.48
Adjusted R-squared	0.699613	S.D. dependent var		28859.59
S.E. of regression	15817.24	Akaike info criterion		22.37476
Sum squared residual	5.00E+09	Schwarz criterion		22.66509
Log likelihood	-284.8719	Hannan-Quinn criterion		22.45837
F-statistic	12.64520	Durbin-Watson stat		1.325411
Prob(F-statistic)	0.000013			

*Significant at 5% critical value

Meanwhile, Table 4 shows the result of multiple linear regression analysis, which included t-test, F-test, as well as coefficient of determination. At a 5% level of significance, the result of the t-test showed a probability value of less than 0.05 implying significant relationships exist between MTR and GDP, MU, ER as well as CR. However, there was no significant relationship between the MTR with IR since the probability value was greater than the critical value of 5%.

Through F-test, all the independent variables, together, were statistically significant in explaining the variation of the MTR since its probability value (0.000013) was less than 0.05. Next, the coefficient of determination (R^2) showed that approximately 75.97% of the variation in MTR can be explained by the changes in all independent

variables and the balance 24.03% can be explained by other factors. Similarly, the value of adjusted R-square showed that there was a 69.96% variation in MTR, can be explained by the changes in independent variables and the balance 20.04% can be explained by other factors.

The results revealed that the unemployment rate (MU) had a significant negative relationship with Malaysian Tourism Receipts (MTR), with a coefficient value of -42,882.75. This implies that an increase of 1 USD in MU would reduce MTR by 42,882.75%, consistent with previous findings that MU negatively affects MTR [5]. Similarly, crime rate (CR) showed a negative influence on MTR. This finding was in line with previous literature [11].

However, GDP and exchange rate (ER) showed a positive and significant influence on MTR, with a coefficient of 93,686.52, 50,225.84 respectively. This suggests that a 1 USD increase in GDP and ER would increase MTR by 93,686.52, 50,225.84 respectively which are consistent with theoretical assumptions. Similar results were reported in previous research, where GDP was found to have a positive and significant impact on MTR [2]. This may be attributed to the role of tourism as a source of foreign exchange, which facilitates the purchase of capital goods and technologies that contribute to broader economic activities.

However, the inflation rate (IR) demonstrated insignificant relationship with MTR, reflected with the probability value was greater than 0.05. This finding is consistent with previous research, which found no long-run relationship in the case of Turkey [13].

CONCLUSION AND RECOMMENDATIONS

To sum up, the purpose of this study is to investigate and assess how Malaysian Tourism Receipts (MTR), the dependent variable, are affected by the independent variables, namely Malaysian Unemployment (MU), Inflation Rate (IR), Exchange Rate (ER), Crime Rate (CR), and GDP per capita (GDP). Specifically, this study examines the relationship between crime rate and selected macroeconomic factors in relation to Malaysia's tourism receipts. The findings show that four variables—GDP, ER, MU, and CR—are significant in explaining the objective of the study.

Based on these findings, several recommendations can be made for Malaysian businesses and the government to increase tourism receipts. For instance, the rise in gross domestic product corresponds with an increase in tourism receipts, highlighting the need for strong cooperation between businesses and the government. One priority for the government should be digital transformation [4]. In addition, the central bank can adjust interest rates to attract more foreign investors and strengthen the domestic currency. Furthermore, efforts should be made to promote Malaysia's unique experiences that showcase its cultural diversity, natural beauty, ecotourism opportunities, and rich heritage, thereby enhancing its international appeal. Lastly, investing in training programs for service industry professionals to improve language skills, cultural awareness, and customer service can significantly enhance visitor satisfaction. A pleasant and welcoming experience encourages positive word-of-mouth and repeat visits; further boosting Malaysia's tourism receipts.

REFERENCES

1. Belloumi, M. (2010). The relationship between tourism receipts, real effective exchange rate and economic growth in Tunisia. International Journal of Tourism Research, 12(5), 550–560. https://doi.org/10.1002/jtr.774
2. Brida, J. G., Gomez, D. M., & Segarra, V. (2020, December). [Article]. https://www.sciencedirect.com/science/article/abs/pii/S0261517720300571
3. Crouch, G. I. (1993). Price elasticities in international tourism. Journal of Travel Research, 17(3), 47–56. https://journals.sagepub.com/doi/10.1177/109634809401700304
4. Laker, B. (2022, December 12). Digitalization could increase GDP by $656 billion says research. Forbes. https://www.forbes.com/sites/benjaminlaker/2022/12/12/digitalization-could-increase-gdp-by-656-billion-says-research/?sh=160f1da549d8
5. Lee, G. M., & Hassan, M. K. H. (n.d.). Impact of foreign economic factors towards tourism

receipts in Malaysia: Indonesia, Thailand, Philippines, and Vietnam. https://feb.untan.ac.id/wp-content/uploads/2023/02/40.pdf

6. Lopez, F. S. (2019, August). Unemployment and growth in the tourism sector in Mexico: Revisiting the growth-rate version of Okun's law. Economies, 7(3), 83. https://www.mdpi.com/2227-7099/7/3/83

7. Martin, R. E., Hill, R. C., & Waters, M. S. (2017). Baumol and Bowen cost effects in research universities. Louisiana State University. https://www.lsu.edu/business/files/economics-files/working-papers/pap17_03.pdf

8. Mosbah, A., & Abd Al Khuja, M. S. (2014). A review of tourism development in Malaysia. [Conference paper/Report].

9. Nair, P., & Thomas, T. K. (2013, December 1). Sustainable tourism in Malaysia: Policies and practices. https://www.semanticscholar.org/paper/Sustainable-Tourism-in-Malaysia.-Policies-and-Nair-Thomas/978ccca7411dfcc88508e29c1a252a3265e336e7

10. Newry, G. (2023). The impact of crime on the development and sustainability of a tourist-based economy. LinkedIn. https://www.linkedin.com/pulse/impact-crime-development-sustainability-tourist-based-gamal/

11. Nunkoo, R., & Gursoy, D. (2012, January). Residents' support for tourism: An identity perspective. Annals of Tourism Research, 39(1), 243–268. https://www.sciencedirect.com/science/article/abs/pii/S0160738311000909

12. Szivas, E., Riley, M., & Airey, D. (2003, January). Labor mobility into tourism. Annals of Tourism Research, 30(1), 64–76. https://www.researchgate.net/publication/238378124_Labor_mobility_into_tourism

13. Yıldırım, B. İ., Yıldırım, F., & Gülmez, M. (2017). Türkiye'de enflasyon ve turizm gelirleri ilişkisi üzerine econometric bir analiz. International Journal of Economics and Administrative Sciences, 1, 69–81.

14. Yuan, G. L. Z. (2023, July). Malaysia's tourism industry challenges amid the Covid-19 pandemic. Asia-Europe Institute, University of Malaya. https://aei.um.edu.my/malaysias-tourism-industry-challenges-amid-the-covid-19-pandemic

APPENDIX

NORMALITY TEST – HISTOGRAM
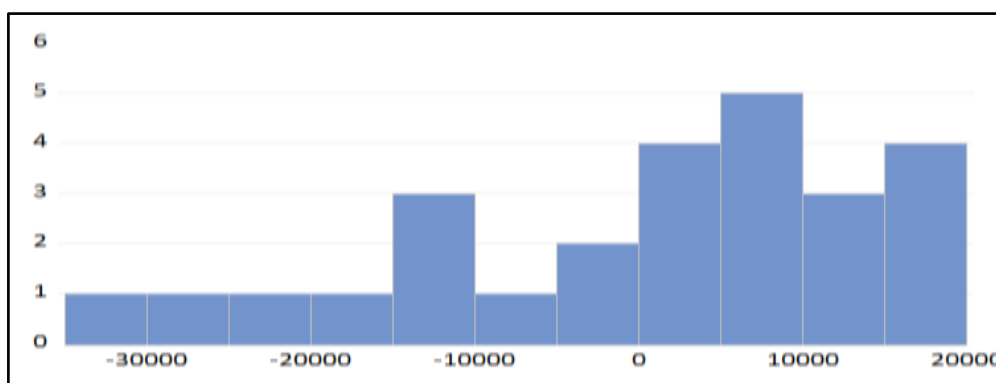
Serial Correlation Test – Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistics	0.993350	Prob. F (2,18)	0.3897
Obs*R-squared	2.584429	Prob. Chi Square (2)	0.2747