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Financial Risk and International Inbound Tourism: A Malaysian Illustration

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Abstract: The impact of financial risk on inbound tourism is explored in this study by examining the effect of shocks in foreign debt level and debt service stability on the tourist arrival rate in Malaysia, based on the Theory of Planned Behavior (TPB). Quarterly data from 2010 to 2020 were obtained from multiple sources, which include the Malaysia Tourism corporate website, the official portal of the Ministry of Economy Malaysia, the Department of Statistics Malaysia, and the Federal Reserve (FRED) Economic statistical website. A VAR model was estimated, together with the Granger causality test, to identify the relationship between financial risk, control variables, and the tourist arrival rate in Malaysia. We specifically consider the effects of financial risk on estimated impulse responses and variance decompositions for the studied variables. Empirical results indicate that there is a unidirectional causality running from foreign debt level stability, debt service stability, and industrial production to tourist arrivals. In addition, there is also bidirectional causality from the effective exchange rate to tourist arrivals and from tourist arrivals to the effective exchange rate. This study is the first of its kind to explore the effect of financial risks in the context of foreign debt levels and debt service stability in Malaysia. The study emphasizes the importance of monitoring the country's debt financing threshold to maintain financial stability, which if violated would be detrimental to tourism.

Keywords: *Foreign debt, financial risk, tourist arrivals, VAR Model, Malaysia.*

1. Introduction and Background

In the tourism industry, the word "risk" frequently conjures up images of unforeseen hazards and potential disruptions to travel plans. Delving deeper into this risk concept will reveal the necessary elements that can be focused on in improving the state of the tourism industry, especially during post-crisis or pandemic periods. Risk plays an important role in shaping the travel landscape, guiding tourists' travel decision-making, and driving innovation in tourism. This research aims to shed light on the significance of financial risk in tourism by demonstrating how a thorough understanding relationship between foreign debt level and debt service contributes to the tourism sector's growth and resilience. The tourism literature has firmly established that the tourism sector is one of the main sources of economic growth for a number of countries Antonakakis et al., (2015). However, tourism's influence on economic growth recedes during crises and booms (Portella-Carbó et al., 2023). This evidence highlighted the importance of economic and financial environment stability for the tourism industry in driving economic growth. Research on scientific methodologies and informative time series models for forecasting international visitor arrivals is still lacking (Makoni et al., 2023). The world today is facing a rise in global debt with a record of $303 trillion in 2021 as compared to $226 trillion in year 2020 (International Monetary Fund, 2021).

These sobering statistics underlined the critical need for managing public debt to avoid severe consequences if the debt level is above the threshold for public debt. External indebtedness may increase the future sovereign default likelihood if it is not managed properly, especially during a crisis period. Against this backdrop, it is increasingly important to respond to the challenges associated with financial risk levels about foreign debt stability. Studies on the relationship between risks and tourism have been widely researched in the past about various events such as geopolitical issues (Lee & Choi, 2023; Zhang et al. 2022; Saint et al., 2020), economic downturns (Portella-Carbó et al., 2023; Hateftabar & Chapuis, 2020), and pandemic (Yang et al., 2020; Esquivias et al., 2021). Despite the vast literature on tourist arrivals studies in response to various types of risks, empirical results documenting the sensitivity of tourist arrivals rate to the visited country's foreign debt stability are rather scarce. To address this gap, this study proposes that tourist arrivals respond differently to foreign debt level (FDS) and foreign debt service (DSS) stability, and conducts impulse response and variance decomposition analyses using data from inbound foreign tourists in Malaysia. The findings indicate that tourist arrivals are sensitive to FDS and DSS, with negative responses to FDS and positive responses to the DDS variable.

The unique thing about this study is that it uses impulse response and variance decomposition analyses to look at the effects of foreign debt level and debt service stability on international inbound tourist arrivals in Malaysia. This is done to prove that financial risks hurt international inbound tourist arrivals by controlling for major macroeconomic variables. Findings obtained in this study are expected to enlighten future researchers on the significant impact of external debt on the tourism industry, which may further justify to what extent the positive role of foreign debt increases on economic growth can no longer be used as an excuse for the government to borrow more money. In other words, additional debt can have a stimulatory effect on economic growth, but this effect may diminish (Lau et al., 2022) as the debt-to-growth ratios approach the debt threshold. Moreover, as Malaysia is trying to further strengthen the Malaysian Ringgit by diversifying its tourism sectors, the findings of this study would have a bearing on the broadening of policy in the context of uncertainty and tourism. The rest of the paper is designed as follows. Section 2 covers the review of past literature on financial risks and tourism. Section 3 delves into data sources and methodology, followed by the discussion of findings in Section 4. Section 5 covers the research implications recommendations, and conclusion.

2. Literature Review

Risk in Tourism: Risk perception is a concept with many different parts and areas of study. Factors affecting the risk perception of tourists range from various attributes including micro and macro determinants. These attributes may encompass negative incidents as perceived by tourists, which include equipment, financial, physical, psychological, satisfaction, social, and time risks (Roehl & Fesenmaier, 1992). The fundamental idea behind the link between risk perception and tourism decisions can be explained by the Theory of Planned Behavior (TPB) as introduced by Ajzen (1985). The TPB theory has been applied to a wide range of disciplines, contexts, and countries, including tourism and hospitality. For example, the TPB has been applied to predicting health-related behaviors (Godin & Kok, 1996)), getting better understanding on the attitudes of marketing (Alavion et al., 2017; Ferdous, 2010), disaster management (Daellenbach et al., 2018)), understanding consumer behavior in Asian region (Jain et al., 2017; Ho et al., 2015; Chien et al., 2012), and new tourist behaviors in different tourism context (Sann et al., 2023; Bui, 2022). Consequently, the TPB seems to be an appropriate framework in the current research scope. According to TPB, tourists' decisions to engage in tourism activities can be predicted by their intention to engage in such behavior. Guided by this theory, Quintal et al. (2010) and Björk and Kauppinen-Räisänen (2013) have been looking at multiple dimensions of travel risks about tourists' risk perceptions, which comprise functional, physical, financial, social, and psychological risks. All these factors are expected to give tourists some ideas about the risk conditions of the destination country, which may influence their willingness and motivation to travel. In the current study, tourists' perceptions of risk and uncertainty were tested using the response of the number of tourist arrivals in Malaysia towards the changes in Malaysia's foreign debt stability and debt service stability.

Financial Risk: Financial risk refers to the potential net financial loss of a purchase, including the possibility that a product or service might need to be repaired, replaced, or the price refunded (Laroche et al., 2004). In the context of tourism, financial risks can be defined as the potential net financial loss of a purchase, such as the fear of losing money if a vacation is left unused or if a travel agency goes bankrupt while travelers are enjoying their purchased holiday (Björk & Kauppinen-Räisänen, 2013). Past research has shown that the financial environment of a country may have a dampening effect on the performance of the tourism industry (Irani et al., 2021), especially during periods of inflation and debt crises (Khalid et al., 2020).

While debt financing may sound like an ideal solution for promoting sustainable financial growth for a country (Xu et al., 2020) and, to some extent, reducing market risk (Hang et al., 2020), there are still pros and cons associated with it. Debt financing could simplify a country's finances and help it get out of outstanding debt faster, but the upfront costs may be steep. Gradual borrowings over time may in the end accumulate a large sum of debt to be paid, which will need refinancing at much higher interest rates in the wake of post-crisis or pandemic inflation. As the debt burdens get heavier, interest costs will be greater, which will then affect tourism expenditures. Excessive government debt can result in economic instability and uncertainties. Lower consumer confidence may result from this, which may influence people's willingness to spend money on non-essentials like travel. As individuals are worried about their financial well-being, they might reduce their spending on traveling, leading to a decline in tourism expenditure. A study conducted by Campos-Soria

(2015) has shown that tourists tended to cut back on tourism expenditures during the debt crisis in 2009 by having fewer holidays, reducing the duration of stay, opting for cheaper means of transport and accommodation, and traveling to destinations closer to home.

These facts illustrate the extent to which the final tourism product needs to fall within the scope of the customer's willingness to pay (Seshadri et al., 2023). Tourist prices are closely related to the amount of tax levied on tourism activities. Countries with high debt may use the tourism market as one of the sources of tax revenue to support government spending and borrowing (Thompson, 2017) since this approach can extract significantly more revenue to increase domestic welfare (Gooroochurn & Sinclair, 2005). However, tax increases are negatively perceived by tourists, as stated in Adedoyin et al. (2023) and Durbarry (2008), who found a negative relationship between tourism tax increases and inbound travel rates. Tourists are unwilling to pay an additional amount of tax unless there is an additional value they will receive in return (Cetin et al., 2017). This could explain why Thailand at one time imposed a tourism tax cut policy to alleviate its tourism industry and economy during the 2011 flood incidents (Ponjan & Thirawat, 2016). Based on all this past literature, it can be said that too much debt may lead to higher financial risks not only for the visited country but also for tourists as a whole. Following this, we hypothesized that a higher dependency on debt would lead to a lower number of inbound tourist arrivals.

3. Research Methodology

Choice of Variables and Dataset: Tourist arrivals are denoted by the TA variable. The unit of measurement is the number of tourists. The quarterly observations from January 2010 to December 2020 are considered in this study. The data source for TA is the Malaysia Tourism corporate site. We also consider two variables measuring the components of debt risk as presented by the International Country Risk Guide (ICRG). According to ICRG methodology, the objective of financial risk rating measures the country's ability to pay its financial obligations. Since this study focuses on the impact of foreign debt level and services stability, two subcomponents in the financial risk rating measures are used which are (i) FDA: foreign debt as a percentage of GDP, and (ii) DSS: foreign debt service as a percentage of export in goods and services. The quarterly data from January 2010 to December 2020 for foreign debt, GDP, and exports of goods and services were obtained from the official portal of the Ministry of Economy Malaysia.

Control Variables: The selection of control variables used in this study is based on the study on inbound tourism conducted by Ghosh (2022). Control variables used in this study include EX, IP and EM variables. EX is the real effective exchange rate for Malaysia, retrieved from Federal Reserve (FRED) Economic data. According to FRED, real effective exchange rates are computed as weighted averages of bilateral exchanger rates adjusted by relative consumer prices. IP measures the economic growth proxied by industrial production, collected from the official portal of the Ministry of Economy Malaysia. According to the Department of Statistics Malaysia (2023)[1], The Industrial Production Index measures the rate of changes in the production of industrial commodities for various industries of the economy within a specified time period. A high index indicates higher economic growth. The EM variable denotes the ratio of exports to imports for Malaysia, gathered from the official portal of the Ministry of Economy Malaysia as an indicator of trade openness. A higher ratio indicates a more open economy, while a lower ratio indicates a more closed economy.

Econometric Specification: The study looks at how the financials (foreign debt stability and debt service stability variables) affect tourism in Malaysia, using effective exchange rate, industrial production, and trade openness as control variables. The general functional form in investigating the impact of financial risk on tourism is expressed in equation 1. $TA_t = f\ (FDS_t, DSS_t, EX_t, IP_t, EM_t, \epsilon_{it}) \cdots$ (1)

Here TA denotes the tourist arrivals, FDS is the foreign debt stability, DSS is the debt service stability, EX is the effective exchange rate, IP is the industry production index, EM is the ratio of exports to imports, and ϵ is the usual error term. A rise in the financial risk is likely to hurt the tourism sector, as will a rise in the country's uncertainty. An increase in financial risk, coupled with a rise in the exchange rate will imply a

[1] http://www.dosm.gov.my/uploads/release-content/file_20230712115301.pdf

slowdown in the tourism business due to the increase in the cost of buying the destination country's currencies. However, a rise in industrial production will help tourism because it will lead to the growth of businesses that support the tourism sector. Growing business activities such as imports and exports will also result in trade expansion that will positively affect the tourism sector.

Unit Root Testing: Before the use of any time series method, it is important to identify whether the series used is stationary or not. Using time series data that are not stationary in the analysis will result in spurious regression, which means that the generated model will not be able to describe the data accurately at different time points (Granger & Newbold (1974). To examine the stationarity of the series, this study used the augmented Dickey-Fuller unit root test (ADF test) (Dickey & Fuller, 1979) and the Phillips-Perron unit root test (PP).

Estimating VAR Model: Suppose that there exists some relationship between Y_t and X_t, then a bivariate model can be set up as equation 2:

$$Y_{1,t} = a_1 + b_{11,1}Y_{1,t-1} + b_{12}Y_{2,t-1} + u_{1,t}$$
$$Y_{2,t} = a_2 + b_{21,1}Y_{1,t-1} + b_{22}Y_{2,t-1} + u_{2,t} \quad (2)$$

In the above equation, $u_{1,t}$ and $u_{2,t} \sim$ IID $(0, \sigma^2)$, Cov$(u_{1,t}, u_{2,t}) = 0$. Transforming equation 2 into the matrix form will result in the following matrix representation:

$$\begin{bmatrix} Y_{1,t} \\ Y_{2,t} \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix} + \begin{bmatrix} b_{11,1} & b_{12,1} \\ b_{21,1} & b_{22,1} \end{bmatrix} \begin{bmatrix} Y_{1,t-1} \\ Y_{2,t-1} \end{bmatrix} + \begin{bmatrix} u_{1,t} \\ u_{2,t} \end{bmatrix} \quad (3)$$

Where, $Y_{1,t}$ and $Y_{2,t}$ are stationary at level variable, $u_{1,t}$ and $u_{2,t}$ are white noise disturbances, and a_1, a_2, $b_{11,1}$, $b_{12,1}$, $b_{21,1}$, $b_{22,1}$, are the coefficients in matrix (3) estimated by ordinary least squares method.

Suppose that $\mathbf{Y}_t = \begin{bmatrix} Y_{1,t} \\ Y_{2,t} \end{bmatrix}$, $\mathbf{a} = \begin{bmatrix} a_1 \\ a_2 \end{bmatrix}$, $\mathbf{b} = \begin{bmatrix} b_{11,1} & b_{12,1} \\ b_{21,1} & b_{22,1} \end{bmatrix}$, $\mathbf{u}_t = \begin{bmatrix} u_{1,t} \\ u_{2,t} \end{bmatrix}$

Then we can come to an equation 4 as follows:

$$\mathbf{Y_t = a + b\,Y_{t-1} + u_t}$$

Therefore, the VAR model containing N variables as well as k lags is:

$$\mathbf{Y_t = a + b_1\,Y_{t-1} + b_2\,Y_{t-1} + \ldots + b_N\,Y_{t-k} + u_t},\ \mathbf{u_t} \sim \text{IID}\ (\mathbf{0, \Omega}) \quad (4)$$

In equation (4), $\mathbf{Y}_t = (Y_{1,t}, Y_{2,t}, \ldots Y_{N,t})'$

$\mathbf{a} = (a_1, a_2, \ldots a_N)'$

$$\textbf{downright bj} = \begin{bmatrix} b_{11,j} & b_{12,j} & \ldots & b_{1N,j} \\ b_{21,j} & b_{22,j} & \ldots & b_{2N,j} \\ \vdots & \vdots & \ddots & \vdots \\ b_{N1,j} & b_{N1,j} & \ldots & b_{NN,j} \end{bmatrix}, \text{j = 1,2,...k}$$

$\mathbf{u}_t = (u_{1,t}, u_{2,t}, \ldots u_{N,t})'$,

$\mathbf{Y}_t$ is the column vector of Nx1 ranks of the time series, u is the coefficient column vector of Nx1 ranks, $a_1, a_2, \ldots a_k$ is the NxN degree parameter matrix, $\mathbf{u}_t \sim$ IID $(\mathbf{0, \Omega})$ is a column vector of Nx1 ranks of random errors, every factor being not autocorrelated. However, the corresponding random errors may be auto-correlated in different equations. On the right of each equation of the VAR model, there are lags of endogenous variables that are not correlated with $\mathbf{u}_t$. Therefore, consistent estimates for parameters with the OLS method for each equation can be obtained.

Granger Causality: The Granger causality test is based on the idea that the cause occurs before the effect, hence if Y_2 is the cause of another event Y_1, then Y_2 should proceed Y_1 (Granger, 1969). More specifically, a variable Y_2 is said to 'Granger-cause' a variable Y_1 if past and present values of Y_2 contain information that helps predict the future value of Y_1 better than using the information contained in the past and present values of Y_1 alone. A Generalization in a multivariate context can be obtained by considering a mx1 vector $y_t = (y'_{1t}, y'_{2t})'$, where y_{1t} and y_{2t} are m_1x1 and m_2x1, ($m_1 + m_2 = m$) variables. Partition the system of equations into two sub-systems:

$$\mathbf{Y}1 = \mathbf{G}1\mathbf{A}11 + \mathbf{G}2\mathbf{A}12 + \mathbf{U}1,$$
$$\mathbf{Y}2 = \mathbf{G}1\mathbf{A}21 + \mathbf{G}2\mathbf{A}22 + \mathbf{U}2 \quad (5)$$

Where $\mathbf{Y}_1$ and $\mathbf{Y}_2$ are T x m1 and T x m2 matrices of observations $Y_{1,t}$ and $Y_{2,t}$, respectively. $\mathbf{G}_1$ and $\mathbf{G}_2$ are the T

x pm_1 and T x pm_2 matrices of observations on the k lagged values of $Y_{1,t-k}$, and $Y_{2,t-k}$, for t= 1,2,… T, and k= 1,2, … k, respectively. The process $Y_{2,t}$ does not Granger-cause $Y_{1,t}$ if the m_1m_2p restrictions $\mathbf{A}_{12} = \mathbf{0}$ hold. The null hypothesis of the Granger causality test is Y_2 does not Granger-cause Y_1, while the alternative hypothesis for this test is Y_2 Granger-cause Y_1. A p-value lower than 0.05 will indicate a rejection of the null hypothesis at a 5% significance level.

4. Results and Discussion

In this section, we discuss the empirical results. Firstly, we proceed with the descriptive statistics for the variables used in this study.

Descriptive Statistics: Figure 1 displays the number of tourist arrivals to Malaysia from the year 2010 until the year 2020. We can learn from Figure 1 that the number of tourists coming to Malaysia has been steadily increasing and decreased from approximately around 24 million to 27 million between the years 2010 to the year 2019 before it experienced a sudden drop of more than 80% from 26.1 million tourists as a result of Covid-19 pandemic.

Figure 1: Number of Tourist Arrivals to Malaysia[2]

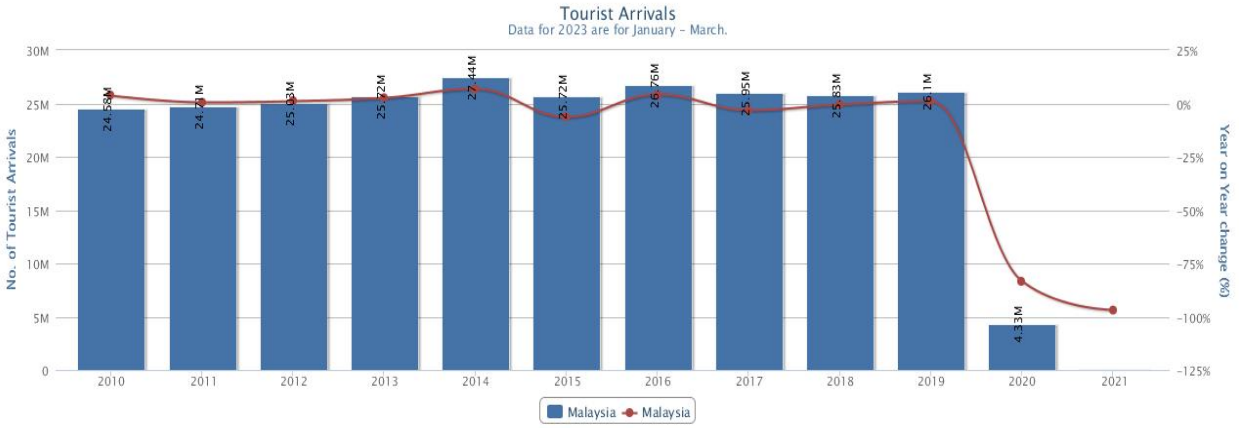


Table 1 reports the descriptive statistics for variables used in this study. Statistics show that between 2010 and 2020, an average of 4.53 million foreign tourists will visit Malaysia per quarter. The number of tourists could be as low as 1.03 million or as high as 6.08 million. Also, during the same time period, the percentage of foreign debt to GDP (FDS) was 58.51%, with a standard deviation of 6.59%. Malaysia has an average foreign debt service number of 16.45% in terms of foreign debt service (FDS). The ICRG guide says that the average FDS ratio in Table 1 is a high-risk component, while the DSS ratio is in the range of very low risk.

Table 1: Descriptive Statistics

VARIABLES	MEAN	MINIMUM	MAXIMUM	STD.DEV	SKEWNESS	KURTOSIS
TA[b]	4,535,494	1,037,285	6,085,523	1,376,730	-.88	2.69
FDS[c]	58.51	47.16	74.81	6.59	0.57	2.71
DSS[d]	16.45	9.56	30.83	4.92	0.83	3.32
EX[e]	108.57	98.36	119.56	7.18	0.14	1.36
IP[f]	2.82	-17.26	6.41	3.74	-3.94	22.04
EM[g]	15.35	5.06	30.87	5.18	0.99	4.19

Notes: TA, FDS, DSS, EX, IP, and EM variables in this table represents the tourist arrivals data, foreign debt service, debt service stability, effective exchange rate, industrial production, and trade openness, respectively. TA is the number of tourist arrivals per quarter.

[2] Source: Tourism Malaysia with the cooperation of Immigration Department

FDS denotes the ratio of foreign debt as a percent of GDP. The unit is in percent.
DSS denotes the ratio of foreign debt service as a percentage of exports in goods and services. The unit is in percent.
EX represents the effective exchange rate index. The unit is index 2020=100.
IP is the industrial production per quarter. The unit is in percent.
EM denotes the ratio of exports to imports per quarter. The unit is in percent.

Correlation Matrix: The results of the correlation matrix in Table 2 show that tourism is negatively correlated with FDS, DDS, and EM. However, the correlation between tourism and industrial production and the effective exchange rate is 0.22 and 0.23, respectively. As no substantial inference can be made based on the results of the correlation matrix, the subsequent section of this paper presents the econometric model and the analysis thereof.

Table 2: Correlation Matrix

VARIABLES	TA	FDS	DSS	EX	IP	EM
TA	1.00					
FDS	-0.28*	1.00				
DSS	-0.38**	0.63***	1.00			
EX	0.23	-0.04	0.24	1.00		
IP	0.22	0.10	0.02	-0.01	1.00	
EM	-0.22	-0.37**	-0.37**	-0.15	-0.28**	1.00

Notes: TA, FDS, DSS, EX, IP, and EM variables in this table represent the log tourist arrivals data, foreign debt service, debt service stability, effective exchange rate, industrial production, and trade openness, respectively. ***, **, and * indicate the results are significant at 1%, 5%, and 10% level, respectively.

Unit Root Tests: Before testing the relationship between financial risks and tourist arrivals to Malaysia, this study applies the augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) unit root tests to determine the stationarity of variables. Table 3 illustrates the results of these tests that consistently record that all series are integrated of *I* (1). As the variables are integrated into *I* (1), the subsequent analyses are conducted using the first differences for all series.

Table 3: ADF and PP Unit Root Test Results

Variables at level	ADF test statistic	Results	PP test statistic	Results
TA	-2.291 (0.1748)	Non-stationary	-2.307 (0.1696)	Non-stationary
FDS	-2.686 (0.0764)	Non-stationary	-2.649 (0.0833)	Non-Stationary
DDS	-3.506 (0.0078)	Stationary	-3.469 (0.0088)	Stationary
EX	-1.138 (-1.138)	Non-stationary	-1.127 (0.7042)	Non-stationary
IP	-5.976 (0.0000)	Stationary	-5.981 (0.0000)	Stationary
EM	-3.377 (0.0118)	Stationary	-3.202 (0.0199)	Stationary
Variables in the first differenced form	**ADF test statistic**	**Results**	**PP test statistic**	**Results**
dTA	-5.093 (0.0000)	Stationary	-5.102 (0.0000)	Stationary
dFDS	-6.880 (0.0000)	Stationary	-7.120 (0.0000)	Stationary
dDDS	-8.717 (0.0000)	Stationary	-10.469 (0.0000)	Stationary

dEX	-6.004 (0.0000)	Stationary	-6.007 (0.0000)	Stationary
dIP	-13.639 (0.0000)	Stationary	-13.522 (0.0000)	Stationary
dEM	-7.268 (0.0000)	Stationary	-8.502 (0.0000)	Stationary

Notes: dTA, dFDS, dDDS, dEX, dIP and dEM are the first differenced variables of log TA, log FDS, log DDS, log EX, log IP, and log EM. Values in parentheses show the p-value for each t-value obtained in ADF and PP unit root tests.

Optimal Lag and Vector Autoregression (VAR) Model: Table 4 presents the results for optimal lag selection. We run the VAR Model to select the optimum lag order. Based on the Akaike Information Criterion (AIC), the optimal lag suggested is 2. After determining the optimal lag, we explore the relationship between the lagged variables for studied independent and dependent variables. Table 5 presents the parameters obtained from the VAR model between TA, FDS, DSS, EX, IP and EM variables. The results in the Model 1 column show that there is a significant relationship between the current value TA with TA (-1), TA (-2), FDS (-2), EX (-2) and IP (-1). This shows that the current values of tourist arrivals can be partly explained by the values of tourist arrivals in the past, the stability of foreign debt, the effective exchange rate, and the level of industrial production. Findings obtained remain robust when the DSS variable is added to the model. The modulus of each eigenvalue for Model 1 and Model 2 are both less than 1, which indicates that the estimates satisfy the eigenvalue stability condition. The stability of the estimated VAR models is shown in Figure 2-1 and Figure 2-2 which visually indicates that the eigenvalues of Model 1 and Model 2 are well inside the unit circle. Given these results, it will allow us to analyze the impulse response and variance decomposition for estimating tourist arrivals to Malaysia.

Table 4: Optimal lag selection (TA, FDS, DDS, EX, IP, EM)

Lag	LR	FPE	AIC	HQ	SC
0	NA	7.3e-10	-4.01164	-3.91978*	-3.74228*
1	84.76	5.2e-10*	-4.38694	-3.74393	-2.50144
2	77.453*	5.5e-10	-4.54732*	-3.35316	-1.04567

Note: * Optimal lag.

Table 5: VAR Model Estimation Results for Estimating Tourist Arrivals in Malaysia

Variables	Model 1	Model 2
TA(-1)	-.4532907*** (0.009)	-.3874001** (0.019)
TA(-2)	-.5548198*** (0.007)	-.5440328*** (0.004)
FDS(-1)	-.4991266 (0.372)	-1.022108* (0.064)
FDS(-2)	-2.367858*** (0.000)	-2.478976*** (0.000)
DSS(-1)		.3180835** (0.038)
DSS(-2)		-.0489271 (0.760)
EX(-1)	1.979415 (0.373)	3.109267 (0.132)
EX(-2)	5.143282*** (0.004)	3.892883** (0.024)
IP(-1)	.1112216** (0.013)	.1133053*** (0.008)

IP(-2)	.054943	.0684681*
	(0.155)	(0.056)
EM(-1)	-.1279267	-.0577761
	(0.327)	(0.637)
EM(-2)	.1550033	.1313558
	(0.195)	(0.280)
Constant	.0571719	.0548409*
	(0.112)	(0.094)
R-square	0.4221	0.5218
LM test	23.0006	35.7397
	(0.57753)	(0.48087)

Notes: Lagged 1 and Lagged 2 variables were indicated with (-1) and (-2), respectively. ***, **, and * indicate that the finding of the VAR model is significant at 1%, 5%, and 10% level, respectively. The P-value for the Lagrange-multiplier (LM) test above 0.05 indicates failure to reject the null hypothesis of no autocorrelation at the observed lag order.

Figure 2: VAR Stability Conditions

Figure 2-1: VAR Stability Conditions for Model 1

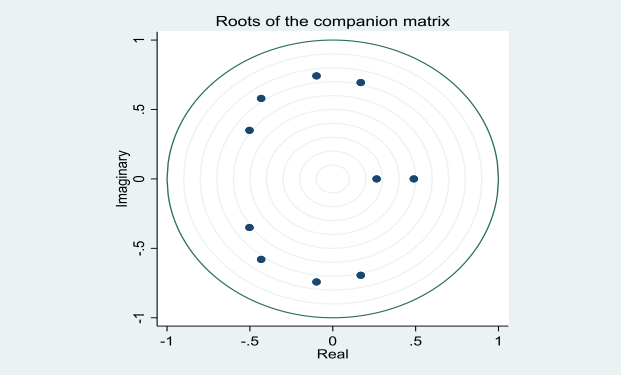
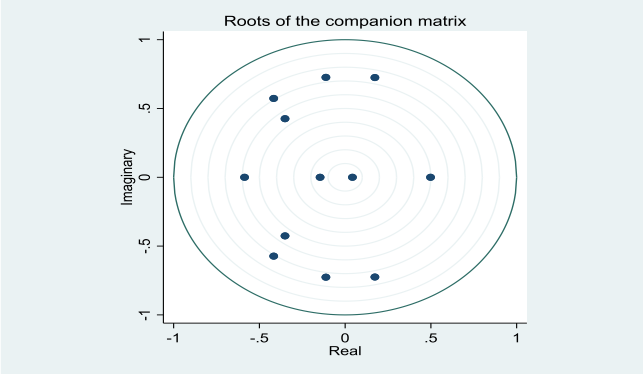


Figure 2-2: VAR Stability Conditions for Model 2



Granger Causality Test: The causality analysis of the relationship between TA, FDS, DSS, EX, IP and EM based on the VAR Model is reported in Table 6. The direction of causality will provide further information for policymakers about the nature of interconnectedness between variables in the Malaysian tourism context. Understanding the causality direction will allow us to understand what should be focused on in shifting or reforming the existing policy structures. Based on the p-value of the test statistics, we can say that there is unidirectional Granger causality from FDS to TA, DSS to TA, and IP to TA. Moreover, we also found a bidirectional Granger causality from EX to TA, and from TA to EX. Such finding adds further evidence to the significance of financial risk factors in the tourism demand model in the context of Malaysia, besides tourist price (Kusni et al., 2013), tourist income (Tan & Soon, 2023), human and technological factors (Nilashi et al., 2019). In addition, the bidirectional causality observed for EX and TA variables contradicts the findings obtained by Tang (2013) who shows a unidirectional relationship running from exchange rate to tourism receipts in Malaysia. The difference in results could be justified by the difference in data coverage used in a prior study.

Tang (2013) used an annual sample of tourist arrivals from the year 1974 to the year 2009, while this study used quarterly data covering the years 2010 to 2020. The bidirectional causal impact between tourist arrivals and exchange rate can be seen in the findings of Odhiambo (2011) and Sharif & Afshan (2016) tourist arrivals estimation in Tanzania and France, respectively. This evidence suggests that appreciation and depreciation in the visited country's currencies value will have effects on future tourist arrivals rate, and tourist arrivals rate will also determine the future value of the visited country's currencies value. The observed relationships between foreign debt level, foreign debt service, and tourist arrivals in this study could be further elaborated using the Theory of Planned Behavior (TPB). In this context, individuals' positive or negative reactions

toward the economic conditions of a country are shaped by their beliefs about how the economic instability is going to affect their tourism decisions. If the tourists believe that a high level of foreign debt indicates economic instability and increases the risk of a financial crisis, they might be more reluctant to visit the country due to their concerns over travel costs, access to services, and overall experience during the visit.

Table 6: Direction of Causality based on Short-Run (Wald Test Statistics)

	Dependent Variables					
	dTA_t	**$dFDS_t$**	**$dDSS_t$**	**dEX_t**	**dIP_t**	**dEM_t**
Independent Variable						
$\sum dTA_{t-2}$	NA	2.3835 (0.3040)	4.6807* (0.0960)	8.8701** (0.0120)	3.1958 (0.2020)	14.26*** (0.0010)
$\sum dFDS_{t-2}$	18.42*** (0.0000)	NA	12.822*** (0.0020)	0.16444 (0.9210)	1.3452 (0.5100)	10.153*** (0.0060)
$\sum dDSS_{t-2}$	7.0848** (0.0290)	0.51359 (0.7740)	NA	4.3952 (0.1110)	0.11127 (0.9460)	5.1877* (0.0750)
$\sum dEX_{t-2}$	7.5202** (0.0230)	4.2302 (0.1210)	3.3124 (0.1910)	NA	0.20205 (0.9040)	3.2665 (0.1950)
$\sum dIP_{t-2}$	7.1624** (0.0280)	0.146 (0.9300)	1.6731 (0.4330)	7.744** (0.0210)	NA	3.1252 (0.2100)
$\sum dEM_{t-2}$	1.4652 (0.4810)	0.96238 (0.6180)	1.8921 (0.3880)	0.55777 (0.7570)	4.8918* (0.0870)	NA

Notes: dTA, dFDS, dDDS, dEX, dIP and dEM are the first differenced variables of log TA, log FDS, log DDS, log EX, log IP, and log EM. The optimal lag is determined by the AIC criterion which justifies the "t-2" indicator in the table. Values in parentheses show the p-value obtained in the Granger Causality test.

Impulse Response and Variance Decomposition Analyses: After establishing the unidirectional causality relation from FDS and DSS to TA, we use the structural VAR impulse response function to demonstrate how tourism in Malaysia reacts to shock in financial risk measures. Figure 3-1 and Figure 3-2 report the VAR impulse response function results of the responses of TA to a shock in FDS and DSS, respectively. The impulse response findings reveal that in the initial stages, a one standard deviation shock on foreign debt stability hurts the tourist arrivals rate. We can see that after two periods (two quarters), the tourist arrivals rate decreases by -1.5%. After that, the tourist arrivals rate adjusted upward and downward by ±0.5%, before it moved back to the initial values after 10 periods. The results obtained for DSS (Figure 3-2); The tourist arrivals rate increases by 2.5% in the first period when there is a 1% standard deviation shock in DSS. Subsequently, starting from the second period, the response of TA to a shock in DSS fluctuates.

Before it becomes consistently stable after the first 10 periods are reached. Figure 4-1 and Figure 4-2 also report through the variance decomposition method that the response of TA to a shock in FDS and DSS becomes stable in the long run. We can see that the changes in TA can be explained by FDS by up to 13% (Figure 4-1), and by DSS by up to 11% (Figure 4-2)[3]. These findings suggest that Malaysian tourism is also affected by the tourism risk perception on the financial risk level of the destination country. Malaysia has been using cultural shows as a site to display creative cultural production and ethnic diversity to tourists (Sarkissian, 1998). According to Cui (2016), the dominant factor influencing tourism risk perception towards destinations that use cultural tourism activities to attract tourists is the financial risk. This is aligned with the Travel Risks Framework as suggested by Quintal et al. (2010) and Björk and Kauppinen-Räisänen (2013) which include financial risk, functional, physical, social and psychological risks.

[3] The exact figures of changes in TA in response to changes in FDS and DSS were obtained from Variance Decomposition table generated in Stata.

Figure 3: Impulse Response of the Tourist Arrivals

Figure 3-1: Impulse Response of TA to FDS

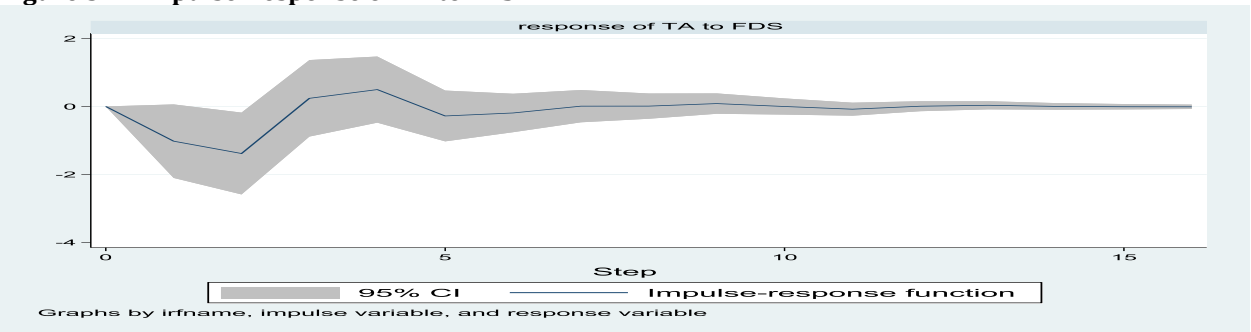


Figure 3-2: Impulse Response of TA to DSS

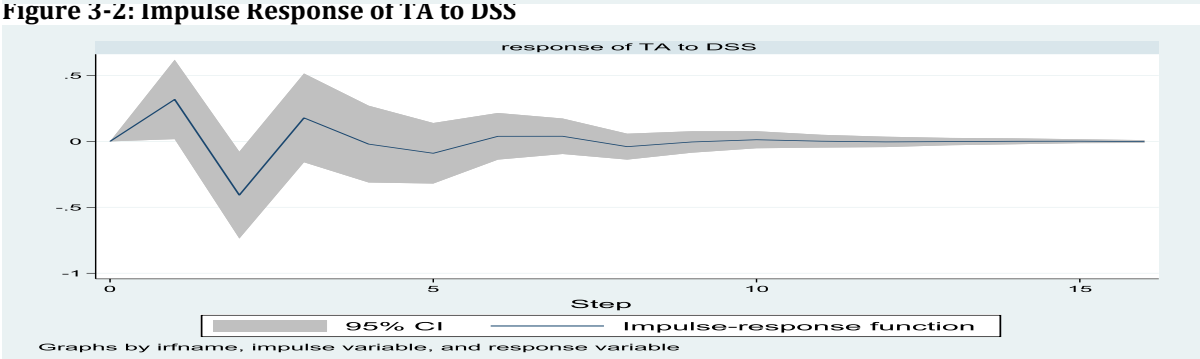


Figure 4: Variance Decomposition of the Tourist Arrivals

Figure 4-1: Variance Decomposition of TA due to FDS

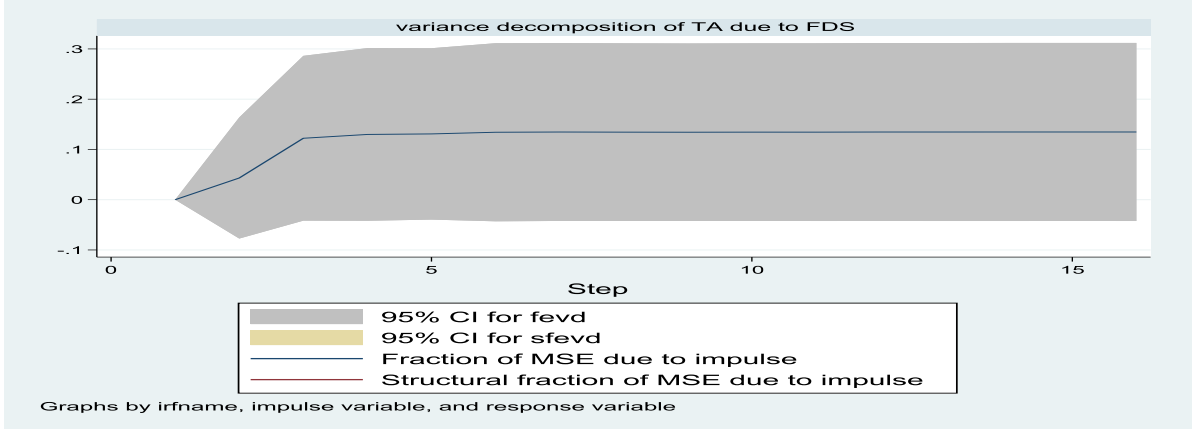
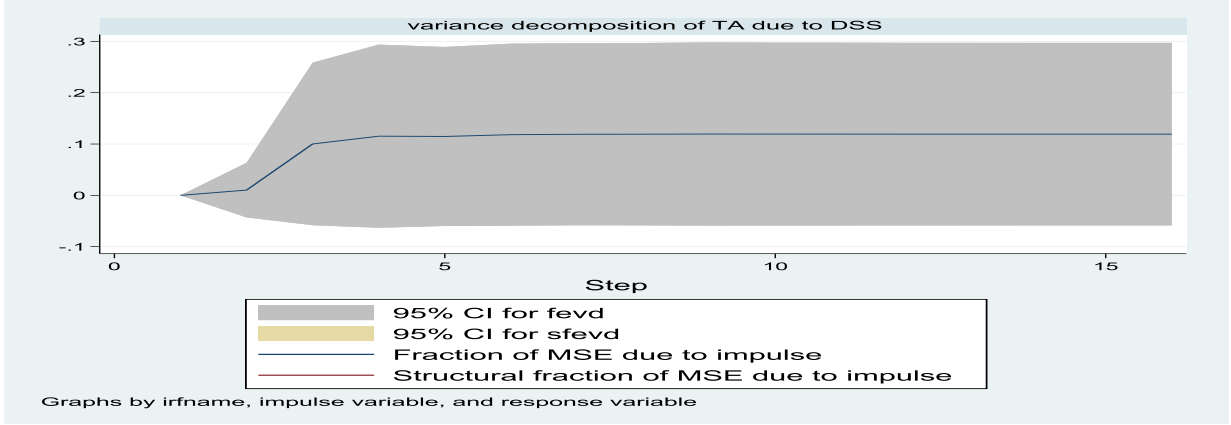


Figure 4-2: Variance Decomposition of TA due to DSS



5. Research Findings Implications and Recommendations

As society and the economy grow, people's standards of living rise, increasing leisure time. This makes the tourism industry grow quickly. With increasing people's travel time and greater tourism space, two aspects have gained greater importance, which include travel safety and travel risk. Tourists' perception of the travel risk will determine their travel behavior, which will influence their decisions on travel motivation, travel destination, and mode of travel. In driving Malaysia's economic growth and development, policymakers should pay greater attention to promoting inbound tourism. With a better understanding of the impact of financial risk on tourist arrivals, one can identify how such risk can affect the expectations of tourists before, during, or even after the tourism consumption process.

This study found that the stability of Malaysia's foreign debt and its ability to pay its debts do affect the number of tourists who visit. This shows that visitors are worried about financial risks when making travel decisions. Higher financial risk has hurt the number of tourists coming to a country for at least the first five quarters after a financial risk shock. These results can help us understand how important it is to include financial risk factors in the timing of risk prevention and strategies for tourists. They can also help Malaysia figure out which resources to use to build up the tourism industry during times when financial risk is high.

The limitation of this study lies in the limited variables used to measure the financial risk level of the visited country. Thus, the results of this study are only based on a small part of the vast literature on risk in tourism. In a future study, it might be a good idea to include relevant and appropriate measures of financial risk along with more recent data to see if the results of the study change based on the financial risk context. Future studies can also look at how well the proposed framework works to explain the different types of financial risk measures that can be used to predict the number of tourists who will visit in the future.

Conclusion: This study empirically investigated the effects of foreign debt stability and debt service stability, the effective exchange rate, industrial production level, and trade openness on tourism in Malaysia using quarterly data sets from January 2010 to December 2020. The analysis begins with the application of ADF and PP unit root tests, followed by the establishment of VAR models to determine the impact of past variable values on another variable. The Granger causality analysis confirms the findings in VAR based on a unidirectional causality running from foreign debt stability, debt service stability, and industrial production to tourist arrivals. In addition, there is also a bidirectional causality from the effective exchange rate to tourist arrivals and from tourist arrivals to the effective exchange rate.

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