


INTERNET-BASED HOTEL MARKETING STRATEGY IN INDONESIA: EMPIRICAL STUDY WITH VECTOR AUTOREGRESSION MODEL

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| ARTICLE INFO | RESUMO |
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| <p>Article history: Received: December, 02nd 2023 Accepted: February, 19th 2024</p> | <p>Purpose: The purpose of this study is to determine how the Indonesian hotel sector may use the internet as a productive and successful marketing tool.</p> |
| <p>Keywords: Internet; Marketing; Hospitality; Vector Autoregression; Indonesia.</p> | <p>Theoretical Framework: The opportunities offered by the internet include ease of accessing and disseminating information about hotel products and services, the ability to reach a wider and more diverse market, and the opportunity to improve the quality and efficiency of services (Kapoor & Kapoor, 2021). However, the internet also poses challenges, such as increasingly fierce competition, changes in consumer preferences and behavior, and threats to data security and privacy (Bandara, Fernando, & Akter, 2020).</p> |
|  | <p>Design/Methodology/Approach: This research uses secondary data from the World Bank and UNWTO regarding Internet users, Number of hotel rooms, Total guests, and Tourism arrivals from 2000 to 2022. This research applies a vector autoregression (VAR) model with two lags to test the relationship between five time variables. series, namely Total Guests, Tourism Arrivals, Room Rate, Number Of Rooms, and Internet Users. The VAR model was chosen because it has the lowest information criteria values, namely AIC, SC, and HQ, which shows a high fit to the data.</p> <p>Findings: Number of Rooms is the variable that has the most influence on other variables, which indicate the capacity and quality of hotel accommodation. Therefore, hotels are advised to increase the Number Of Rooms in order to attract more tourists and increase revenue. Apart from that, Total Guests, Tourism Arrivals, and Room Rate also have a significant effect on several other variables, which reflect the dynamics of market demand and supply, as well as hotel competitiveness. Therefore, hotels are advised to maintain and improve these variables with appropriate marketing strategies, such as promotions, distribution channels and social networks. Meanwhile, Internet User is the weakest variable in the VAR model, which has a negative relationship with Total Guests, Tourism Arrivals, and Room Rate, which reflects the influence of information technology on consumer behavior.</p> <p>Research, Practical & Social Implications: This research makes a practical contribution by providing solutions for the hotel industry in Indonesia to increase performance and income by utilizing the internet as an effective and efficient marketing medium.</p> <p>Originality/Value: This research provides a theoretical contribution by examining the influence of the internet as an effective and efficient marketing medium for the hotel industry in Indonesia, which is a topic that has rarely been researched before.</p> <p>Doi: https://doi.org/10.26668/businessreview/2024.v9i3.4309</p> |

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**ESTRATÉGIA DE MARKETING HOTELEIRO BASEADA NA INTERNET NA INDONÉSIA:
ESTUDO EMPÍRICO COM MODELO DE AUTORREGRESSÃO VETORIAL****RESUMO**

Objetivo: O objetivo deste estudo é determinar como o setor hoteleiro indonésio pode usar a Internet como uma ferramenta de marketing produtiva e bem-sucedida.

Referencial Teórico: As oportunidades oferecidas pela internet incluem a facilidade de acesso e divulgação de informações sobre produtos e serviços hoteleiros, a capacidade de atingir um mercado mais amplo e diversificado e a oportunidade de melhorar a qualidade e eficiência dos serviços (Kapoor & Kapoor, 2021). No entanto, a internet também apresenta desafios, como a concorrência cada vez mais acirrada, mudanças nas preferências e comportamentos dos consumidores e ameaças à segurança e privacidade dos dados (Bandara, Fernando, & Akter, 2020).

Desenho/Metodologia/Abordagem: Esta pesquisa utiliza dados secundários do Banco Mundial e da OMT sobre usuários da Internet, número de quartos de hotel, total de hóspedes e chegadas de turismo de 2000 a 2022. Esta pesquisa aplica um modelo de autorregressão vetorial (VAR) com duas defasagens para testar a relação entre cinco variáveis de tempo. séries, nomeadamente Total de Hóspedes, Chegadas Turísticas, Tarifa de Quarto, Número de Quartos e Utilizadores de Internet. O modelo VAR foi escolhido por apresentar os valores mais baixos dos critérios de informação, nomeadamente AIC, SC e HQ, o que apresenta um elevado ajuste aos dados.

Resultados: O Número de Quartos é a variável que mais influencia outras variáveis, que indicam a capacidade e a qualidade do alojamento hoteleiro. Portanto, os hotéis são aconselhados a aumentar o número de quartos para atrair mais turistas e aumentar as receitas. Além disso, o Total de Hóspedes, as Chegadas Turísticas e a Tarifa de Quarto também têm um efeito significativo em diversas outras variáveis, que refletem a dinâmica da procura e oferta do mercado, bem como a competitividade hoteleira. Portanto, os hotéis são aconselhados a manter e melhorar estas variáveis com estratégias de marketing adequadas, como promoções, canais de distribuição e redes sociais. Entretanto, o Utilizador de Internet é a variável mais fraca do modelo VAR, que tem uma relação negativa com o Total de Hóspedes, as Chegadas Turísticas e a Tarifa de Quarto, o que reflete a influência da tecnologia de informação no comportamento do consumidor.

Pesquisa, Implicações Práticas e Sociais: Esta pesquisa dá uma contribuição prática ao fornecer soluções para a indústria hoteleira na Indonésia aumentar o desempenho e a receita, utilizando a Internet como um meio de marketing eficaz e eficiente.

Originalidade/Valor: Esta pesquisa fornece uma contribuição teórica ao examinar a influência da Internet como um meio de marketing eficaz e eficiente para a indústria hoteleira na Indonésia, um tema raramente pesquisado antes.

Palavras-chave: Internet, Marketing, Hospitalidade, Autoregressão Vetorial, Indonésia.

**ESTRATEGIA DE MARKETING HOTELERO BASADA EN INTERNET EN INDONESIA: ESTUDIO
EMPÍRICO CON MODELO DE AUTORREGRESIÓN VECTORIAL****RESUMEN**

Propósito: El propósito de este estudio es determinar cómo el sector hotelero de Indonesia puede utilizar Internet como una herramienta de marketing productiva y exitosa.

Referente teórico: Las oportunidades que ofrece internet incluyen la facilidad de acceso y difusión de información sobre productos y servicios hoteleros, la capacidad de llegar a un mercado más amplio y diversificado y la oportunidad de mejorar la calidad y eficiencia de los servicios (Kapoor & Kapoor, 2021). Sin embargo, Internet también presenta desafíos como una competencia feroz, cambios en las preferencias y comportamientos de los consumidores y amenazas a la seguridad y privacidad de los datos (Bandara, Fernando y Akter, 2020).

Metodología: Esta investigación utiliza datos secundarios del Banco Mundial y la OMT sobre usuarios de Internet, número de habitaciones de hotel, huéspedes totales y llegadas de turistas de 2000 a 2022. Esta investigación aplica un modelo de vector autorregresivo (VAR) con dos rezagos para probar la relación entre cinco variables de tiempo. serie, a saber, total de huéspedes, llegadas de turistas, tarifa de habitación, número de habitaciones y usuarios de Internet. Se eligió el modelo VAR porque tiene los valores de criterios de información más bajos, a saber, AIC, SC y HQ, lo que muestra un alto ajuste a los datos.

Conclusiones: El número de habitaciones es la variable que más influye sobre otras variables que indican la capacidad y calidad del alojamiento hotelero. Por lo tanto, se recomienda a los hoteles aumentar el número de habitaciones para atraer más turistas y aumentar los ingresos. Aparte de eso, el total de huéspedes, las llegadas de turistas y el precio de la habitación también tienen un efecto significativo en varias otras variables, que reflejan la dinámica de la oferta y la demanda del mercado, así como la competitividad hotelera. Por ello, se recomienda a los hoteles mantener y mejorar estas variables con estrategias de marketing adecuadas, como promociones, canales de distribución y redes sociales. Mientras tanto, el Usuario de Internet es la variable más débil en el modelo VAR,

que tiene una relación negativa con el Total de Huéspedes, las Llegadas de Turismo y la Tarifa de la Habitación, lo que refleja la influencia de las tecnologías de la información en el comportamiento del consumidor.

Implicaciones de la Investigación: Esta investigación hace una contribución práctica al proporcionar soluciones para que la industria hotelera en Indonesia aumente el rendimiento y los ingresos mediante la utilización de Internet como un medio de marketing eficaz y eficiente.

Originalidad/Valor: Esta investigación aporta una contribución teórica al examinar la influencia de Internet como un medio de marketing eficaz y eficiente para la industria hotelera en Indonesia, un tema poco investigado antes.

Palabras clave: Internet, Marketing, Hospitalidad, Vector autorregresión, Indonesia.

1 BACKGROUND

The tourism industry is one sector that has an important role in the Indonesian economy. Indonesia has great potential to develop the tourism industry as a source of national income. One important aspect of the tourism industry is the hotel industry (Afriani & Mutmainah, 2021). The hotel industry is a provider of accommodation services for tourists who need a place to stay while traveling. The hotel industry also plays a role in creating a positive image and comfort for tourists, thereby increasing satisfaction and loyalty. Therefore, the hotel industry must be able to manage and market the products and services it offers effectively and efficiently (Asmit et al., 2020).

Marketing management is one of the main functions in the hotel industry. Marketing management is the process of analyzing, planning, implementing and controlling programs aimed at creating, establishing and maintaining profitable exchanges with target markets. Marketing management must be able to identify market needs and desires, determine potential market segments, determine appropriate marketing strategies, and measure marketing performance (Supriadi et al., 2023). In carrying out marketing management, the hotel industry must pay attention to various factors that influence consumer behavior. These factors can be internal, such as consumer motivation, attitudes, and preferences, or external, such as the social, cultural, and economic environment. One external factor that is increasingly influencing consumer behavior is the development of information and communication technology, especially the internet (Murniati & Bawono, 2020).

The Internet is a global computer network that connects various electronic devices around the world. The internet provides various information, services and facilities that can be utilized by consumers and producers (Priyanto et al., 2022). The internet also allows interaction and communication between consumers and producers directly, quickly and cheaply. The

internet has changed the way consumers search for, compare, and buy products and services, including hospitality products and services (Angeloni & Rossi, 2021).

The internet also provides opportunities and challenges for the hotel industry in carrying out marketing management (Labanauskaitė et al., 2020). The opportunities offered by the internet include ease of accessing and disseminating information about hotel products and services, the ability to reach a wider and more diverse market, and the opportunity to improve the quality and efficiency of services (Kapoor & Kapoor, 2021). However, the internet also poses challenges, such as increasingly fierce competition, changes in consumer preferences and behavior, and threats to data security and privacy (Bandara et al., 2020). Therefore, this research aims to analyze the influence of the internet on marketing management in the hotel industry in Indonesia.

The purpose of this study is to determine how the Indonesian hotel sector may use the internet as a productive and successful marketing tool. Several factors are included in this study, including the number of hotel rooms, the total number of guests, Internet users, and tourism arrivals. There is a relationship between Internet users, hotel room numbers, total guests, and tourism arrivals, as may be observed from these four variables. Depending on the circumstances, there may be a good or negative association. The number of tourists, hotel rooms, and hotel guests may all rise in response to an increase in internet users. Nonetheless, a decline in internet users may result in fewer visitors, hotel rooms, and hotel rooms overall. The vector autoregressive (VAR) approach can be used to examine this relationship in more detail.

Internet users are the number of internet users in Indonesia, which shows market potential and information sources for the hotel industry (Setyowati et al., 2021). Number of hotel rooms is the number of hotel rooms available in Indonesia, which shows the capacity and competition of the hotel industry (Andriani et al., 2021). Total guests are the number of guests staying at hotels in Indonesia, which shows the level of demand and income of the hotel industry (Agustina & Yosintha, 2020). Tourism arrival is the number of visits by foreign tourists to Indonesia, which shows the opportunities and challenges for the hotel industry in serving the international market (Permatasari & Esquivias, 2020). Hotel room rate is the average price for renting hotel rooms in Indonesia, which shows the level of supply and profitability of the hotel industry (Musthofa & Rijanta, 2023).

It is hoped that this research can contribute to the development of marketing management science, especially in the context of the hotel industry in Indonesia. It is also hoped

that this research will provide benefits to hotel industry practitioners, government and society in improving the performance and welfare of the tourism sector in Indonesia.

2 LITERATURE REVIEW

The Internet is a global computer network that connects various electronic devices around the world. The internet provides various information, services and facilities that can be utilized by consumers and producers (Shen et al., 2020). The internet also allows interaction and communication between consumers and producers directly, quickly and cheaply. The internet has changed the way consumers search for, compare, and purchase products and services, including hospitality products and services (Hu & Yang, 2020).

The hotel industry is one sector that contributes greatly to the Indonesian economy. The hotel industry is an important part of the tourism industry, which provides accommodation services for tourists who need a place to stay while on holiday (Damayanti & Rusminingsih, 2021). The hotel industry also has a role in creating a positive impression and comfort for tourists, which can influence the level of satisfaction and loyalty (Chapuzet & Prabowo, 2021). Therefore, the hotel industry must be able to organize and promote the products and services it offers in an effective and efficient manner (Hasudungan et al., 2021).

One of the important roles in the hotel business is marketing management. It involves the stages of analysis, planning, implementation, and monitoring of programs designed to create, develop, and maintain mutually beneficial relationships with target markets. Marketing management must be able to recognize what the market wants and needs, find promising market segments, determine appropriate marketing strategies, and evaluate marketing performance (Mio et al., 2022). In carrying out marketing management, hotel businesses must consider various factors that influence consumer behavior. These factors can come from within, such as motivation, attitudes and consumer choices, or from outside, such as the social, cultural and economic environment. One external factor that is increasingly playing an important role in consumer behavior is advances in information and communication technology, especially the internet (Han, 2021).

The hotel industry has benefited and challenged from the internet. The benefits provided by the internet include the ease of obtaining and disseminating information about hospitality products and services, the potential to attract a larger and more diverse market, and the opportunity to improve the quality and efficiency of services. However, the internet also brings

challenges, such as fiercer competition, changes in consumer tastes and behavior, and data security and privacy risks (Lau, 2020). There are several studies that have examined the influence of the internet on marketing management in the hotel industry in Indonesia, both from the consumer and producer side (Japutra & Situmorang, 2021).

The internet has a significant influence on the marketing management of the hotel industry in Indonesia, both from the consumer and producer side. The internet can be an effective and efficient marketing medium, if the hotel industry can take advantage of the opportunities and overcome the challenges posed by the internet. Several factors that need to be considered in internet marketing management include web appearance, price, website quality, trust, shopping life style, fashion involvement, and impulse buying behavior (Adam, Ibrahim et al., 2020).

The internet is one of the factors that influences the development of the tourism industry in various countries. With the internet, tourists can search for information, book tickets and access online services related to travel. This can increase tourists' interest and ease in visiting a destination (Pencarelli, 2020). One indicator that can be used to measure the development of the tourism industry is the number of hotel rooms available. The number of hotel rooms reflects the accommodation capacity that can accommodate incoming tourists. If the number of hotel rooms increases, it means that there is high demand from tourists to stay overnight in a destination (Duric & Potočnik Topler, 2021). Apart from the number of hotel rooms, the number of guests staying at the hotel can also be another indicator. The number of hotel guests shows how many tourists actually use existing accommodation facilities. If the number of hotel guests increases, it can be interpreted that there is an increase in tourist visits to a destination (Cho, 2020).

The number of tourist arrivals can also be an important indicator. The number of tourist arrivals describes how many people come to a destination to travel. The number of tourist arrivals is influenced by various factors, such as attractiveness, accessibility and tourism promotion (Gidebo, 2021). Based on previous research we developed the following hypothesis.

H0: There is no relationship between Internet users, Number of hotel rooms, Total guests, and Tourism arrivals.

H1: There is a relationship between Internet users, Number of hotel rooms, Total guests, and Tourism arrivals.

3 RESEARCH METHODS

In this study, secondary data covering the years 2000–2022 from the World Bank and the World Tourism Organization (UNWTO) were used. The variables in table 1 are described here.

Table 1

Variable Description

| Variable | Description | Unit of Account | Source |
|-----------------|--|-----------------|------------|
| Internet User | number of internet users in Indonesia, which shows market potential and information sources for the hotel industry | Percent | World Bank |
| Number of Room | number of hotel rooms available in Indonesia, which shows the capacity and competition of the hotel industry | Units | UNWTO |
| Total Guest | the number of guests staying at hotels in Indonesia, which shows the level of demand and income of the hotel industry | Person | UNWTO |
| Tourism Arrival | the number of foreign tourist visits to Indonesia, which shows the opportunities and challenges for the hotel industry in serving the international market | Person | UNWTO |
| Room Rate | average price of hotel room rental in Indonesia, which shows the level of supply and profitability of the hotel industry | USD | World Bank |

Source: author's processing

A vector autoregression (VAR) model was employed to account for the correlation between every variable. Without having to make a distinction between endogenous and exogenous variables, the VAR model lets us examine the relationship between many time series variables. VAR can be used to anticipate and monitor the effects of shocks on a system of variables, as well as to test for causation.

Using the Augmented Dickey Fuller (ADF), Im-Pesaran-Shin, Levin, Lin & Chu t, and PP - Fisher Chi-square methods, we undertook stationarity tests on the data. In order to make the data stationary if it is not, we apply modifications like differencing or logging. Using information criteria that yield the lowest value, such as the Schwarz Bayesian Criterion (SBC) or Akaike Information Criterion (AIC), we find the ideal lag length for the VAR model. For every equation, we use the Ordinary Least Square (OLS) approach to estimate the VAR model. The form of the VAR model will be as follows:

$$\begin{array}{l}
 InU_t \quad c_1 \quad a_{11} \quad a_{12} \quad a_{13} \quad a_{14} \quad a_{15} \quad InU_{t-1} \quad e_{1t} \\
 NoR_t \quad c_2 \quad a_{21} \quad a_{22} \quad a_{23} \quad a_{24} \quad a_{25} \quad NoR_{t-1} \quad e_{2t} \\
 [TGS_t] = [c_3] + [a_{31} \quad a_{32} \quad a_{33} \quad a_{34} \quad a_{35}][TGS_{t-1}] + [e_{3t}] \quad (1) \\
 TAr_t \quad c_4 \quad a_{41} \quad a_{42} \quad a_{43} \quad a_{44} \quad a_{45} \quad TAr_{t-1} \quad e_{4t} \\
 RR_t \quad c_5 \quad a_{51} \quad a_{52} \quad a_{53} \quad a_{54} \quad a_{55} \quad RR_{t-1} \quad e_{5t}
 \end{array}$$

In another way, it can be written as follows:

$$\begin{array}{l}
 InU_t = c_1 + a_{11}InU_{t-1} + a_{12}NoR_{t-1} + a_{13}TGS_{t-1} + a_{14}TAr_{t-1} + a_{15}RR_{t-1} + e_{1t} \\
 NoR_t = c_2 + a_{21}InU_{t-1} + a_{22}NoR_{t-1} + a_{23}TGS_{t-1} + a_{24}TAr_{t-1} + a_{25}RR_{t-1} + e_{2t} \\
 TGS_t = c_3 + a_{31}InU_{t-1} + a_{32}NoR_{t-1} + a_{33}TGS_{t-1} + a_{34}TAr_{t-1} + a_{35}RR_{t-1} + e_{3t} \quad (2) \\
 TAr_t = c_4 + a_{41}InU_{t-1} + a_{42}NoR_{t-1} + a_{43}TGS_{t-1} + a_{44}TAr_{t-1} + a_{45}RR_{t-1} + e_{4t} \\
 RR_t = c_5 + a_{51}InU_{t-1} + a_{52}NoR_{t-1} + a_{53}TGS_{t-1} + a_{54}TAr_{t-1} + a_{55}RR_{t-1} + e_{5t}
 \end{array}$$

With InU as Internet User, NoR as Number of Rooms, TGs as Total Guests, TAr as Tourism Arrival, RR as Work Participation, α as coefficient, t as time series, c as constant, and e as error term, we use the Impulse test Response Function (IRF) to explore the impact of shocks on one variable on other variables in the model. IRF shows how a variable reacts to a shock of one standard deviation unit in another variable in a certain time period. We use the Variance Decomposition (VD) test to calculate the contribution of shocks to one variable to the variance of other variables in the model. VD divides the variance of a variable into parts that are caused by shocks to the variable itself and other variables in a certain time period. We analyzed and interpreted the results of the VAR model, IRF test, and VD test. We conclude the research results and provide appropriate policy suggestions or implications.

4 RESULTS AND DISCUSSION

Description Statistics is a branch of statistics that focuses on collecting, presenting and explaining data using tables, graphs and statistical measures. Statistical Description is important for vector autoregressive (VAR) models because it can help in determining the appropriate order or lag for the VAR model and to determine the characteristics and relationships between the variables involved in the VAR model. The results of descriptive statistics are presented in table 2.

Table 2

Statistical Description

| | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
|--------------|-------------|-----------------|-----------|----------------|---------------|
| Mean | 61946.57 | 7571472. | 48.01565 | 453705.2 | 19.93970 |
| Median | 49704.00 | 6234000. | 48.06000 | 381457.0 | 12.28000 |
| Maximum | 132690.0 | 16107000 | 58.75000 | 870783.0 | 66.48461 |
| Minimum | 29794.00 | 4032189. | 33.79000 | 252984.0 | 0.925564 |
| Std. Dev. | 34785.41 | 3707177. | 5.833208 | 200041.6 | 20.52200 |
| Skewness | 1.060790 | 1.170272 | -0.517321 | 0.770812 | 1.079560 |
| Kurtosis | 2.755899 | 3.213233 | 3.439322 | 2.182831 | 2.861163 |
| Jarque-Bera | 4.370659 | 5.293467 | 1.210842 | 2.917521 | 4.486031 |
| Probability | 0.112441 | 0.070882 | 0.545845 | 0.232524 | 0.106138 |
| Sum | 1424771. | 1.74E+08 | 1104.360 | 10435220 | 458.6130 |
| Sum Sq. Dev. | 2.66E+10 | 3.02E+14 | 748.5790 | 8.80E+11 | 9265.354 |
| Observations | 23 | 23 | 23 | 23 | 23 |

Based on table 2, the average number of guests staying at the hotel is around 61946.57 people, with a middle or median value of 49704 people. The highest number of guests who have stayed is 132690 people, while the lowest number of guests is 29794 people. The standard deviation value of 34785.41 indicates that there is quite a large variation between the number of guests staying at hotels in Indonesia in the calculation period.

The average number of tourist arrivals to Indonesia is around 7571472 people, with a middle or median value of 6234000 people. The highest number of tourist arrivals ever recorded was 16107000 people, while the lowest number of tourist arrivals was 4032189 people. The standard deviation value of 3707177 shows that there is a very large variation between the number of tourist arrivals to Indonesia.

The average hotel room rate was approximately \$48.01565, with a mean of \$48.06. The highest room rate ever offered was \$58.75, while the lowest room rate was \$33.79. The standard deviation value of 5.833208 indicates that there is a relatively small variation between hotel room rates.

The average number of rooms available in hotels is around 453705.2 rooms, with a mean or median value of 381457 rooms. The highest number of rooms ever available was 870783 rooms, while the lowest number of rooms was 252984 rooms. The standard deviation value of 200041.6 indicates that there is quite a large variation between the number of rooms available in hotels.

The average percentage of internet users in Indonesia is around 19.93970%, with a mean or median value of 12.28%. The highest percentage of internet users ever recorded was 66.48461%, while the lowest percentage of internet users was 0.925564%. The standard

deviation value of 20.52200 shows that there is a very large variation between the percentage of internet users in Indonesia.

The distribution of data on the number of guests staying at hotels is skewed to the left, with the long tail on the right. The data distribution is sharper and has heavier tails than the normal distribution. The data distribution is not normal, with a large Jarque-Bera value and a small probability value. The total number of guests staying at the hotel is 1424771 people, and the squared sum of the differences between the number of guests and the average guest is $2.66E+10$.

The distribution of data on the number of tourist arrivals to Indonesia is skewed to the left, with a long tail on the right. The data distribution is sharper and has heavier tails than the normal distribution. The data distribution is not normal, with a large Jarque-Bera value and a small probability value. The total number of tourist arrivals to Indonesia is $1.74E+08$ people, and the sum of the squares of the differences between the number of tourist arrivals and the average tourist arrivals is $3.02E+14$.

The distribution of hotel room rate data is skewed to the right, with a long tail on the left. The data distribution is sharper and has heavier tails than the normal distribution. The data distribution is not normal, with large Jarque-Bera values and large probability values. The total amount of the hotel room rate is 1104.36 dollars, and the squared sum of the difference between the room rate and the average room rate is 748.5790.

The distribution of data on the number of rooms available in hotels is skewed to the left, with the long tail on the right. The data distribution is flatter and has lighter tails than the normal distribution. The data distribution is not normal, with a large Jarque-Bera value and a small probability value. The total number of rooms available in the hotel is 10435220 rooms, and the sum of the squares of the difference between the number of rooms and the average room is $8.80E+11$.

The distribution of data on the percentage of internet users in Indonesia is skewed to the left, with a long tail on the right. The data distribution is sharper and has heavier tails than the normal distribution. The data distribution is not normal, with a large Jarque-Bera value and a small probability value. The total percentage of internet users in Indonesia is 458.6130%, and the sum of the squares of the difference between the percentage of internet users and the average percentage of internet users is 9265.354.

The VAR model requires stationary time series data so that the estimation results are valid and do not give rise to spurious regression, namely regression that has a high R-squared

value but there is no actual causal relationship between the variables. If time series data is not stationary, then the VAR model can cause errors in hypothesis testing, forecasting, and implication analysis. To anticipate this, a stationarity test with a unit root test is needed. The stationarity test with the unit root test is important in the vector autoregression (VAR) model, which is a model that connects several time series variables with their own lag values and other variables. The stationarity test results are presented in table 3.

Table 3*Stationarity Test*

| Level | | | | |
|--|-----------|---------|----------------|-----|
| Method | Statistic | Prob.** | Cross-sections | Obs |
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | 5.93525 | 1.0000 | 5 | 104 |
| Null: Unit root (assumes individual unit root process) | | | | |
| Im, Pesaran and Shin W-stat | 2.63566 | 0.9958 | 5 | 104 |
| ADF - Fisher Chi-square | 9.02036 | 0.5302 | 5 | 104 |
| PP - Fisher Chi-square | 7.30054 | 0.6968 | 5 | 110 |
| 1st difference | | | | |
| Method | Statistic | Prob.** | Cross-sections | Obs |
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | -0.16023 | 0.4364 | 5 | 93 |
| Null: Unit root (assumes individual unit root process) | | | | |
| Im, Pesaran and Shin W-stat | -449.570 | 0.0000 | 5 | 93 |
| ADF - Fisher Chi-square | 42.6505 | 0.0000 | 5 | 93 |
| PP - Fisher Chi-square | 53.5806 | 0.0000 | 5 | 105 |
| 2nd difference | | | | |
| Method | Statistic | Prob.** | Cross-sections | Obs |
| Null: Unit root (assumes common unit root process) | | | | |
| Levin, Lin & Chu t* | -507.067 | 0.0000 | 5 | 87 |
| Null: Unit root (assumes individual unit root process) | | | | |
| Im, Pesaran and Shin W-stat | -965.416 | 0.0000 | 5 | 87 |
| ADF - Fisher Chi-square | 93.4579 | 0.0000 | 5 | 87 |
| PP - Fisher Chi-square | 603.665 | 0.0000 | 5 | 100 |

Source: author's processing

At the level of the Levin, Lin & Chu t* test, the statistical value is 5.93525, and the probability value is 1.0000. This probability value is greater than the commonly used significance level, namely 0.01, 0.05, or 0.1. This shows that the data is not stationary at level. The same thing was also found in the Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, PP - Fisher Chi-square tests which confirmed that the data was not stationary at level. In the 1st difference in the Levin, Lin & Chu t* test, the statistical value is -0.16023, and the probability value is 0.4364. This probability value is greater than the significance level usually used, namely 0.01, 0.05, or 0.1. This shows that the data is not stationary at the 1st difference based

on the Levin, Lin & Chu t test. However, for the Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square, PP - Fisher Chi-square tests, the probability value for the three methods is 0.0000, which is smaller than the commonly used significance levels, namely 0.01, 0.05, or 0.1. This means that H₀ is rejected and H₁ is accepted for all three methods, which means the data is stationary at the 1st difference. And for the 2nd difference, all methods show that the data is stationary at the 2nd difference. Based on the results of the stationarity test in table 3, the 2nd difference is used. To ensure that the VAR model built has good statistical properties, such as the absence of autocorrelation or heteroscedasticity in the residuals, and has a low information value, the VAR Lag Order Selection Criteria is carried out. VAR Lag Order Selection Criteria is a criterion used to determine the optimal number of lags for a vector autoregressive (VAR) model. The VAR model is a model that describes the relationship between several time series variables by using the lag of these variables as an explanatory variable. The optimal number of lags is the number of lags that can explain the dynamics of time series data well without causing overfitting or underfitting. Criterion information is a measure that combines model complexity (number of parameters) and model quality (likelihood value). The lower the value of the criterion information, the better the model. There are several VAR Lag Order Selection Criteria that can be used, such as Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), Hannan-Quinn Criterion (HQ), and others. Each criterion has its own advantages and disadvantages, and can produce different amounts of lag. Therefore, it is important to compare these criteria and choose the one that best suits the purpose of the analysis. The results of the VAR Lag Order Selection Criteria are presented in table 4.

Table 4

VAR Lag Order Selection Criteria

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|------------|-----------|-----------|-----------|-----------|-----------|
| 0 | -9.622.047 | NA | 6.96e+33 | 92.11474 | 92.36343 | 92.16871 |
| 1 | -8.460.961 | 165.8694 | 1.29e+30 | 83.43773 | 84.92990 | 83.76157 |
| 2 | -7.720.316 | 70.53759* | 1.98e+28* | 78.76492* | 81.50057* | 79.35863* |

Source: author's processing

Table 4's values denoted by a star (*) show that two delays are the ideal number for the VAR model. This indicates that the VAR model with the lowest criterion information value—AIC, SC, and HQ—was constructed utilizing two lags of the time series variables. A low criteria information value suggests that the quality and complexity of the VAR model are well-balanced. In addition, the LR value indicates that the two-lag VAR model performs better than

the one-lag or no-lag VAR model. Following the selection of the ideal lag, Vector Autoregression estimation is performed and the results are shown in Table 5.

Table 5
Vector Autoregression Estimates Lag 2

| | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
|-----------------|-------------|-----------------|------------|----------------|---------------|
| Total Guest | -1.530379 | -1.467791 | -0.000352 | -2.127182 | -6.85E-05 |
| | (0.88162) | (48.7940) | (0.00010) | (0.69930) | (6.3E-05) |
| | [-1.73587] | [-3.00814] | [-3.45254] | [-3.04186] | [-1.08592] |
| Tourism Arrival | -0.005539 | -0.098260 | -5.86E-07 | -0.006571 | 3.77E-07 |
| | (0.00891) | (0.49289) | (1.0E-06) | (0.00706) | (6.4E-07) |
| | [-0.62198] | [-0.19936] | [-0.56862] | [-0.93020] | [0.59210] |
| Room Rate | 2103.257 | -56120.76 | 0.000280 | 10390.82 | -0.202844 |
| | (3657.20) | (202411.) | (0.42307) | (2900.90) | (0.26175) |
| | [0.57510] | [-0.27726] | [0.00066] | [3.58193] | [-0.77496] |
| Number Of Room | 0.925196 | 109.5504 | 0.000176 | 0.237283 | 4.36E-05 |
| | (0.23714) | (13.1250) | (2.7E-05) | (0.18810) | (1.7E-05) |
| | [3.90140] | [8.34672] | [6.41591] | [1.26145] | [2.56794] |
| Internet User | -9.583.945 | -1179303. | -2.066.493 | -1.631.974 | 0.129140 |
| | (4621.94) | (255805.) | (0.53467) | (3666.14) | (0.33079) |
| | [-2.07358] | [-4.61016] | [-3.86499] | [-0.44515] | [0.39040] |
| C | -388376.6 | -4,3E+07 | -5.874.154 | 96978.17 | -4.447.464 |
| | (135876.) | (7520178) | (15.7183) | (107777.) | (9.72468) |
| | [-2.85832] | [-5.72673] | [-3.73715] | [0.89980] | [-0.45734] |
| R-squared | 0.889410 | 0.971281 | 0.949080 | 0.997855 | 0.998370 |
| Adj. R-squared | 0.778821 | 0.942563 | 0.898160 | 0.995710 | 0.996741 |
| Sum sq. resids | 2.71E+09 | 8.30E+12 | 36.26610 | 1.71E+09 | 13.88167 |
| S.E. equation | 16462.22 | 911116.1 | 1.904366 | 13057.89 | 1.178205 |
| F-statistic | 8.042430 | 33.82067 | 18.63860 | 465.2013 | 612.5924 |
| Log likelihood | -2.258.927 | -3.101.783 | -3.553.450 | -2.210.275 | -2.545.120 |
| Akaike AIC | 22.56121 | 30.58841 | 4.431857 | 22.09785 | 3.471543 |
| Schwarz SC | 23.10834 | 31.13554 | 4.978988 | 22.64499 | 4.018674 |
| Mean dependent | 64906.00 | 7806041. | 48.39714 | 472513.6 | 21.69851 |
| S.D. dependent | 35003.87 | 3801695. | 5.967476 | 199363.1 | 20.63697 |

Source: author's processing

In the Total Guest Equation, the variables Tourism Arrival, Room Rate, Number of Rooms, and Internet Users are not statistically significant in influencing Total Guests, because the absolute t-statistic value is smaller than 1.96. Only the constant variable C is statistically significant, with a t-statistic value of -2.85832. This means that if all explanatory variables are zero, then Total Guests will decrease by 388376.6 units.

In the Tourism Arrival Equation, the variables Total Guest, Room Rate, Number Of Rooms, and Internet Users are not statistically significant in influencing Tourism Arrival, because the absolute t-statistic value is smaller than 1.96. Only the constant variable C is statistically significant, with a t-statistic value of -5.72673. This means that if all explanatory variables are zero, then Tourism Arrival will decrease by 4.3E+07 units.

In the Room Rate Equation, the Total Guest, Tourism Arrival, and Internet User variables are not statistically significant in influencing the Room Rate, because the absolute t-statistic value is smaller than 1.96. Only the Number Of Rooms and constant C variables are statistically significant, with t-statistic values of 3.58193 and -3.73715. This means that if the Number Of Rooms increases by one unit, then the Room Rate will increase by 10390.82 units, and if all explanatory variables are zero, then the Room Rate will decrease by 5,874,154 units.

In the Number of Rooms equation, the variables Total Guests, Tourism Arrivals, and Internet Users are statistically significant in influencing the Number of Rooms, because the absolute t-statistic value is greater than 1.96. The coefficient values for Total Guest, Tourism Arrival, and Internet User are 0.925196, 109.5504, and 4.36E-05, which shows that these variables have a positive influence on Number Of Rooms. The Room Rate and constant C variables are not statistically significant, because the absolute t-statistic value is smaller than 1.96.

In the Internet User Equation, the variables Total Guest, Tourism Arrival, Room Rate, and constant C are statistically significant in influencing Internet Users, because the absolute t-statistic value is greater than 1.96. The coefficient values for Total Guest, Tourism Arrival, Room Rate, and constant C are -9,583,945, -1179303, -2,066,493, and -4,447,464, which shows that these variables have a negative influence on Internet Users. The Number Of Room variable is not statistically significant, because the absolute t-statistic value is smaller than 1.96.

R-squared shows how well the model explains the variance of the dependent variable. A high R-squared value indicates a good model. It can be seen that all variables have high R-squared values, above 0.8, which means the VAR model can explain most of the variance of these variables. Adj. R-squared adjusts the R-squared value based on the number of independent variables and the number of observations. Adj Value A high R-squared indicates a good model. it can be seen that all variables have the value Adj. A high R-squared, above 0.7, means that the VAR model can explain most of the variance of these variables by considering the number of independent variables and observations.

Sum sq. residuals indicates the sum of squared residuals of the model. Sum sq. value Low resid indicate a good model. It can be seen that the Number Of Room and Internet User

variables have the value Sum sq. low residuals, below $2E+09$, which means the VAR model has small residuals for these variables. S.E. equation shows the standard error of the model. The value of S.E. A low equation indicates a good model. It can be seen that the variables Room Rate and Internet User have values S.E. equation is low, below 2, which means the VAR model has a small error for these variables.

The F-statistic shows the statistical significance of the overall model. A high F-statistic value indicates a significant model. It can be seen that all variables have high F-statistic values, above 8, which means the VAR model is statistically significant for all variables. Log likelihood shows the likelihood that the model fits the data. A high log likelihood value indicates a good model. It can be seen that the variables Room Rate and Internet User have high Log likelihood values, above -3, which means the VAR model has a high probability for these variables.

Akaike AIC indicates the Akaike information criterion of the model. A low Akaike AIC value indicates a good model. It can be seen that the Room Rate and Internet User variables have low Akaike AIC values, below 5, which means the VAR model has good information criteria for these variables. Schwarz SC indicates the Schwarz information criterion of the model. A low Schwarz SC value indicates a good model. It can be seen that the Room Rate and Internet User variables have low Schwarz SC values, below 5, which means the VAR model has good information criteria for these variables.

Mean dependent shows the average of the dependent variable. The Mean dependent value shows the level or scale of the dependent variable. It can be seen that the Tourism Arrival variable has a high Mean Dependent value, above $7E+06$, which means this variable has a high level compared to other variables. S.D. dependent shows the standard deviation of the dependent variable. S.D. value dependent shows the variation or dispersion of the dependent variable. It can be seen that the Tourism Arrival variable has an S.D. value. high dependent, above $3E+06$, which means this variable has high variation compared to other variables.

Based on the VAR estimation results, it can be concluded that H1 is accepted, namely there is a relationship between Internet users, Number of hotel rooms, Total guests, and Tourism arrivals. The relationships between these variables vary. The variable that has the most influence on hotel marketing performance is Number Of Rooms, which has a positive relationship with Total Guests, Tourism Arrivals, and Room Rate. This variable reflects the capacity and quality of accommodation offered by hotels. Therefore, hotels must increase the Number Of Rooms to attract more tourists and increase revenue. Other variables that also influence hotel marketing performance are Total Guests, Tourism Arrivals, and Room Rate.

These variables reflect market demand and supply, as well as hotel competitiveness. Therefore, hotels must maintain and improve these variables with appropriate marketing strategies, such as promotions, distribution channels and social networks. The weakest variable in the VAR model is Internet User, which has a negative relationship with Total Guests, Tourism Arrivals, and Room Rate. This variable reflects the influence of information technology on consumer behavior. Therefore, hotels must pay attention to and utilize this variable in a positive way, such as providing good internet facilities, creating an attractive website, and optimizing online bookings. In the vector autoregressive (VAR) model, the Impulse Response Function (IRF) test is a method used to trace the response of an endogenous variable to a shock or shock to another variable. This test is important because it can describe the dynamics of relationships between variables visually and intuitively, test causality hypotheses between variables empirically, and provide useful information for economic and business policy. This test can show the direction, magnitude and duration of the response of a variable to a shock to another variable, determine whether there is a one-way or two-way relationship between variables and its statistical significance, and help policy makers and decision makers understand short-term and long-term impacts from an event or policy to relevant variables. The results of the Impulse Response Function test are presented in table 6.

Table 6*Impulse Response Function test*

| Response of Total Guest: | | | | | |
|------------------------------|-------------|-----------------|-----------|----------------|---------------|
| Period | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 16462.22 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 10150.66 | -1391.376 | -6104.561 | 4838.618 | -3791.856 |
| 3 | 8795.016 | -4786.922 | -13234.62 | 8739.921 | -6523.902 |
| 4 | 17442.54 | 1468.828 | -9410.427 | 4537.541 | -3247.910 |
| 5 | 16579.31 | -2095.268 | 1138.578 | 5736.506 | -8437.180 |
| 6 | 29354.00 | -12275.17 | -8005.580 | 16114.53 | -13252.24 |
| 7 | 29643.82 | -7010.663 | -17706.87 | 15907.12 | -11533.82 |
| 8 | 4583.210 | -5841.414 | -1253.558 | 11935.72 | -14082.93 |
| 9 | 14363.69 | -13013.15 | 13551.52 | 13101.44 | -12897.14 |
| 10 | 13618.43 | -10977.36 | 15567.84 | 11265.95 | -8438.327 |
| Response of Tourism Arrival: | | | | | |
| Period | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 824941.9 | 386785.9 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 1483588. | -324208.3 | -342707.5 | 473525.7 | -444282.2 |
| 3 | 1285053. | -579839.5 | -1705989. | 1066465. | -809629.0 |
| 4 | 1921630. | 137930.2 | -1260139. | 527043.9 | -417903.5 |
| 5 | 1585870. | -279426.0 | 152580.1 | 610781.3 | -1046406. |
| 6 | 3736102. | -1340294. | -616598.5 | 1666081. | -1396980. |
| 7 | 3288745. | -907642.1 | -1804963. | 1789326. | -1427295. |
| 8 | 358997.0 | -898237.2 | -319588.8 | 1495655. | -1664037. |
| 9 | 1258536. | -1268748. | 1596637. | 1230289. | -1265261. |

| 10 | 650132.1 | -1112665. | 2593176. | 876678.2 | -804374.2 |
|-----------------------------|-------------|-----------------|-----------|----------------|---------------|
| Response of Room Rate: | | | | | |
| Period | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 1.538416 | 0.382612 | 1.055223 | 0.000000 | 0.000000 |
| 2 | 2.591652 | -0.708596 | -0.062680 | 1.095049 | -0.622221 |
| 3 | 0.671427 | -1.001491 | -2.722090 | 1.998445 | -1.183862 |
| 4 | 0.559264 | 0.526478 | -1.380228 | 0.610290 | -0.155470 |
| 5 | 0.397036 | 0.248740 | 2.129844 | 0.035457 | -0.620786 |
| 6 | 3.365014 | -1.777472 | 0.879718 | 1.846416 | -1.249837 |
| 7 | 2.074396 | -1.071263 | -2.420151 | 2.171549 | -1.011488 |
| 8 | -3.797789 | 0.092284 | -0.020916 | 0.683785 | -0.665948 |
| 9 | -2.600777 | -0.241303 | 4.381424 | -0.420299 | 0.169111 |
| 10 | -0.839539 | -0.457802 | 4.877863 | -0.504237 | 0.849487 |
| Response of Number Of Room: | | | | | |
| Period | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | -1177.094 | 16.68800 | -7063.709 | 10919.10 | 0.000000 |
| 2 | 30871.05 | 7761.838 | -11478.70 | 5473.176 | 5042.253 |
| 3 | 2377.200 | 1503.355 | -14240.76 | 14185.01 | -9640.452 |
| 4 | 42010.31 | -7847.545 | -30151.76 | 24698.64 | -10804.80 |
| 5 | 61394.16 | 6088.054 | -34302.40 | 19767.41 | -11301.88 |
| 6 | 52771.04 | -11294.06 | -25469.89 | 33935.16 | -31389.89 |
| 7 | 110361.3 | -26341.96 | -49365.46 | 53660.47 | -38691.84 |
| 8 | 118764.7 | -14716.01 | -54328.26 | 53452.02 | -43387.04 |
| 9 | 87037.13 | -37101.73 | -30420.40 | 68496.73 | -66881.30 |
| 10 | 139562.1 | -51124.94 | -26920.00 | 81180.88 | -65786.98 |
| Response of Internet User: | | | | | |
| Period | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | -0.452643 | 0.622819 | -0.052305 | 0.588149 | 0.668373 |
| 2 | 0.160707 | 0.270591 | -0.544548 | 0.554628 | 0.098922 |
| 3 | 0.575961 | 0.454098 | -1.341685 | 0.964207 | 0.139631 |
| 4 | 1.647321 | 0.432866 | -1.679242 | 0.997394 | -0.251765 |
| 5 | 3.210733 | 0.146567 | -2.101742 | 1.585068 | -0.781491 |
| 6 | 5.613283 | -0.411680 | -3.226988 | 2.478194 | -1.609950 |
| 7 | 7.458990 | -0.832484 | -4.430225 | 3.496110 | -2.585880 |
| 8 | 9.450705 | -1.504644 | -4.911378 | 4.554843 | -3.767597 |
| 9 | 12.15066 | -2.404928 | -4.970951 | 5.805140 | -5.012084 |
| 10 | 13.99812 | -3.592919 | -4.910670 | 7.294330 | -6.454708 |

Source: author's processing

The Total Guest response to Tourism Arrival shocks is negative in periods 2 to 10, which means that if there is a decrease in the number of tourists coming to Indonesia, the number of hotel guests will also decrease. This response was greatest in period 6, namely -12275.17, which means that if there is a decrease in the number of tourists by one unit, then the number of hotel guests will decrease by 12275.17 units.

In other words, if hotel room costs rise, the number of guests will first decline but eventually rise. The total guest response to room rate shocks is negative in periods 2 to 4 and positive in periods 5 to 10. The answer peaked in period 10, at 15567.84. This indicates that a one-unit increase in hotel room pricing will result in a 15567.84-unit rise in hotel occupancy.

In the range of 2 to 10, the total guest response to the "number of room shock" is positive, indicating that a rise in hotel rooms will also result in an increase in hotel guests. The reaction peaked in period 6, at 16114.53. This indicates that for every unit increase in hotel rooms, there will be a corresponding rise in hotel guests of 16114.53 units.

In the range of 2 to 10, the total guest response to shocks from internet users is negative. This indicates that as the number of internet users rises, so will the number of hotel visitors. The reaction peaked in period 8, at -14082.93. This indicates that for every unit increase in internet users, there will be a corresponding 14082.93 unit loss in hotel guests.

According to the results of the Impulse Response Function test, shocks in the tourism arrival, room rate, number of rooms, and internet user variables affect the number of hotel visitors. Should the number of tourists decline, hotel room rates rise, or the number of internet users rise, the number of hotel guests will also decline. If there are more hotel rooms available, there will be more guests staying at the hotel. The number of hotel visitors' reactions to shocks to other variables differ in terms of timing, intensity, and direction.

The reaction of Tourism Arrival to Total Guest shocks is negative for periods 2 through 10, indicating a decline in the number of tourists visiting Indonesia with an increase in hotel guests. The reaction peaked in period 6, at -1340294. This indicates that for every unit increase in hotel occupancy, there will be a corresponding fall in tourists of 1340294.

The response of Tourism Arrival to shocks in room rates is negative in periods 2 to 4 and positive in periods 5 to 10. This indicates that as hotel room costs rise, initially fewer tourists would visit Indonesia, but ultimately more will. The answer peaked in period 10, or 2593176. This indicates that a one-unit increase in hotel room costs will result in a 2593176-unit rise in tourism.

The response of Tourism Arrival to shocks related to the number of hotel rooms is positive in periods 2 through 10, indicating that an increase in hotel room supply will lead to an increase in the number of visitors visiting Indonesia. The answer peaked in period 7, or 1789326. This indicates that for every unit increase in hotel rooms, there will be a corresponding rise in tourists of 1789326 units.

The response of Tourism Arrival to shocks from Internet users is negative in periods 2 through 10, indicating a decline in the number of tourists visiting Indonesia with an increase in internet users. The reaction peaked in period 8, or -1664037, indicating that for every unit increase in internet users, there will be a corresponding fall in tourists of 1664037.

According to the results of the Impulse Response Function test, shocks to the variables total guest, room rate, number of rooms, and internet user affect the number of visitors visiting Indonesia. If there is a rise in hotel room rates, an increase in hotel guests, or an increase in internet users, the number of tourists will decline. If there are more hotel rooms available, then there will be more tourists. The way, size, and duration of the response of tourist numbers to shocks to other variables varies. These findings indicate that there is a trade-off between foreign and domestic tourists in Indonesia. This trade-off connection implies that there will be a decline in foreign tourists and vice versa for every increase in local tourism. Numerous factors, including preferences, purchasing power, availability, and competition from both domestic and foreign tourists, may contribute to this.

Hotel room rates will rise initially but eventually fall in reaction to an increase in the number of visitors; this is seen by the fact that the Room Rate response to Total Guest shocks is positive in periods 1 through 6 and negative in periods 8 through 10. The response was highest in period 10, namely -4.877863. This indicates that for every unit increase in hotel occupancy, the price of hotel rooms will drop by 4.877863 units.

When there is an increase in the number of tourists visiting Indonesia, hotel room prices will rise in certain periods but fall in other periods. This is because the room rate response to tourism arrival shocks is positive in periods 1, 4, and 5 and negative in periods 2, 3, and 6 to 10. The largest response occurred in period 3, specifically -2.722090. This indicates that for every unit increase in travelers, hotel room prices will drop by 2.722090 units.

In other words, if there is an increase in the number of hotel rooms, hotel room prices will increase for the most of the period but will decrease in the final period. The room rate reaction to number of room shocks is positive in periods 2 to 7 and negative in periods 9 and 10. Period 7 saw the largest response, 2.171549, indicating that a one-unit increase in the number of hotel rooms would result in a 2.171549-unit increase in room prices.

In other words, if there is an increase in internet users, hotel room costs will decline in most times but will increase in other periods. The Room Rate reaction to Internet User shocks is negative in periods 1 to 6 and 8 and positive in periods 7, 9, and 10. The price of hotel rooms will rise by 0.849487 units if the number of internet users increases by one unit, as indicated by the reaction that was strongest in period 10.

Based on the Impulse Response Function test, hotel room prices are influenced by shocks in the Total Guest, Tourism Arrival, Number Of Room and Internet User variables. Hotel room prices will decrease if there is an increase in the number of hotel guests, an increase

in hotel room prices, or an increase in the number of internet users. Hotel room prices will increase if there is an increase in the number of hotel rooms. The response of hotel room prices to shocks to other variables varies in direction, magnitude, and duration. These results indicate that digital marketing can influence hotel room prices through these variables. Digital marketing is a marketing strategy that involves promoting products or services using digital technology such as the internet, social media, search engines, email, and mobile devices. Digital marketing can help hotels reach a wider audience, save costs and increase return on investment.

The Number Of Rooms response to the Total Guest shock is positive in the period 2 to 10, which means that if there is an increase in the number of hotel guests, the number of hotel rooms will also increase. This response was greatest in period 10, namely 81180.88, which means that if there is an increase in the number of hotel guests by one unit, then the number of hotel rooms will increase by 81180.88 units.

The Number Of Rooms response to Tourism Arrival shocks is positive in periods 1 and 2 and negative in periods 4 to 10, which means that if there is an increase in the number of tourists coming to Indonesia, the number of hotel rooms will increase at first, but will decrease in the end. This response was greatest in period 9, namely -68496.73, which means that if there is an increase in the number of tourists by one unit, then the number of hotel rooms will decrease by 68496.73 units.

The Number Of Rooms response to Room Rate shocks is negative in periods 1 to 3 and 7 to 10 and positive in periods 4 to 6, which means that if there is an increase in hotel room prices, the number of hotel rooms will decrease in most of the period, but will increase in other periods. This response was greatest in period 1, namely -10919.10, which means that if there is an increase in hotel room prices by one unit, then the number of hotel rooms will decrease by 10919.10 units. The Number Of Rooms response to Internet User shocks is positive in period 2 and negative in periods 3 to 10, which means that if there is an increase in the number of internet users, the number of hotel rooms will increase in the early period, but will decrease in the final period. This response was greatest in period 9, namely -66881.30, which means that if there is an increase in the number of internet users by one unit, then the number of hotel rooms will decrease by 66881.30 units.

Based on the Impulse Response Function test, the number of hotel rooms is influenced by shocks to the Total Guest, Tourism Arrival, Room Rate and Internet User variables. The number of hotel rooms will increase if there is an increase in the number of hotel guests, an increase in the number of hotel rooms, or a decrease in the number of tourists or hotel room

prices. The number of hotel rooms will decrease if there is an increase in the number of tourists, hotel room prices, or internet users. The response of the number of hotel rooms to shocks to other variables varies in direction, magnitude, and duration.

The response of Internet Users to Total Guest shocks is positive in periods 1 to 3 and negative in periods 4 to 10, which means that if there is an increase in the number of hotel guests, the number of internet users will also increase at first, but will decrease in the end. This response was greatest in period 10, namely -6.454708, which means that if there is an increase in the number of hotel guests by one unit, the number of internet users will decrease by 6.454708 units.

The response of Internet Users to Tourism Arrival shocks is positive in periods 1 to 5 and negative in periods 6 to 10, which means that if there is an increase in the number of tourists coming to Indonesia, the number of internet users will also increase at first, but will decrease in the end. This response was greatest in period 10, namely -3.592919, which means that if there is an increase in the number of tourists by one unit, then the number of internet users will decrease by 3.592919 units.

The response of Internet Users to Room Rate shocks is negative in periods 1 to 7 and positive in periods 8 to 10, which means that if there is an increase in hotel room prices, the number of internet users will decrease at first, but will increase in the end. This response was greatest in period 10, namely 4.910670, which means that if there is an increase in hotel room prices by one unit, the number of internet users will increase by 4.910670 units.

The response of Internet Users to Number Of Room shocks is positive in period 1 and negative in periods 2 to 10, which means that if there is an increase in the number of hotel rooms, the number of internet users will increase in the early period, but will decrease in the final period. This response was greatest in period 9, namely -5.805140, which means that if there is an increase in the number of hotel rooms by one unit, the number of internet users will decrease by 5.805140 units.

Based on the Impulse Response Function test, the number of internet users is influenced by shocks in the Total Guest, Tourism Arrival, Room Rate and Number Of Room variables. The number of internet users will decrease if there is an increase in the number of hotel guests, an increase in hotel room prices, or an increase in the number of hotel rooms. The number of internet users will increase if there is a decrease in the number of tourists or hotel room prices. The response of the number of internet users to shocks to other variables varies in direction, magnitude and duration. These results indicate that hotel internet marketing can influence the

number of internet users through these variables. Hotel internet marketing is a marketing strategy that uses digital technology such as websites, social media, search engines, email and mobile devices to promote hotel products or services in the online world. Hotel internet marketing can help hotels reach a wider audience, save costs, and increase return on investment.

Table 7*Variance Decomposition*

| Variance Decomposition of Total Guest: | | | | | | |
|--|----------|-------------|-----------------|-----------|----------------|---------------|
| Period | S.E. | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 16462.22 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 21237.53 | 82.92984 | 0.429221 | 8.262298 | 5.190805 | 3.187834 |
| 3 | 29075.80 | 53.39387 | 2.939494 | 25.12659 | 11.80485 | 6.735193 |
| 4 | 35658.04 | 59.42882 | 2.124112 | 23.67108 | 9.468195 | 5.307794 |
| 5 | 40695.82 | 62.22316 | 1.895853 | 18.25157 | 9.256122 | 8.373302 |
| 6 | 56283.89 | 59.72980 | 5.747634 | 11.56493 | 13.03629 | 9.921355 |
| 7 | 69248.68 | 57.78316 | 4.821876 | 14.17814 | 13.88857 | 9.328252 |
| 8 | 72061.57 | 53.76464 | 5.109880 | 13.12313 | 15.56887 | 12.43347 |
| 9 | 78039.45 | 49.23099 | 7.137608 | 14.20507 | 16.09350 | 13.33283 |
| 10 | 82683.76 | 46.56852 | 8.120902 | 16.19911 | 16.19285 | 12.91863 |
| Variance Decomposition of Tourism Arrival: | | | | | | |
| Period | S.E. | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 911116.1 | 81.97838 | 18.02162 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 1917117. | 78.40264 | 6.930366 | 3.195582 | 6.100843 | 5.370574 |
| 3 | 3219651. | 43.72809 | 5.700553 | 29.20895 | 13.13481 | 8.227600 |
| 4 | 4014749. | 51.03285 | 3.784248 | 28.63715 | 10.17080 | 6.374958 |
| 5 | 4494727. | 53.16434 | 3.405665 | 22.96280 | 9.961129 | 10.50606 |
| 6 | 6408197. | 60.14618 | 6.049973 | 12.22275 | 11.66013 | 9.920972 |
| 7 | 7823132. | 58.02950 | 5.405489 | 13.52447 | 13.05512 | 9.985421 |
| 8 | 8200319. | 53.00560 | 6.119489 | 12.46080 | 15.20837 | 13.20574 |
| 9 | 8723681. | 48.91770 | 7.522456 | 14.36028 | 15.42721 | 13.77235 |
| 10 | 9268412. | 43.82865 | 8.105388 | 20.54994 | 14.56179 | 12.95424 |
| Variance Decomposition of Room Rate: | | | | | | |
| Period | S.E. | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 1.904366 | 65.25990 | 4.036611 | 30.70349 | 0.000000 | 0.000000 |
| 2 | 3.526415 | 73.04339 | 5.214869 | 8.985692 | 9.642735 | 3.113310 |
| 3 | 5.166670 | 35.71599 | 6.186614 | 31.94367 | 19.45314 | 6.700587 |
| 4 | 5.439310 | 33.28244 | 6.518819 | 35.26058 | 18.81076 | 6.127399 |
| 5 | 5.893087 | 28.80810 | 5.731710 | 43.10142 | 16.02900 | 6.329772 |
| 6 | 7.413261 | 38.80879 | 9.370953 | 28.64517 | 16.33271 | 6.842375 |
| 7 | 8.485460 | 35.59718 | 8.746224 | 29.99804 | 19.01517 | 6.643377 |
| 8 | 9.345921 | 45.85687 | 7.219615 | 24.72910 | 16.21027 | 5.984137 |
| 9 | 10.65695 | 41.22395 | 5.603816 | 35.92198 | 12.62273 | 4.627532 |
| 10 | 11.80061 | 34.12682 | 4.720761 | 46.38297 | 10.47720 | 4.292246 |
| Variance Decomposition of Number Of Room: | | | | | | |
| Period | S.E. | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 13057.89 | 0.812600 | 0.000163 | 29.26305 | 69.92418 | 0.000000 |
| 2 | 37025.90 | 69.61818 | 4.394607 | 13.25073 | 10.88194 | 1.854548 |
| 3 | 43310.27 | 51.18183 | 3.332293 | 20.49577 | 18.68005 | 6.310049 |
| 4 | 73062.47 | 51.04648 | 2.324607 | 24.23293 | 17.99170 | 4.404288 |
| 5 | 104113.3 | 59.91167 | 1.486727 | 22.78908 | 12.46516 | 3.347355 |
| 6 | 128598.4 | 56.10839 | 1.745789 | 18.85984 | 15.13384 | 8.152141 |
| 7 | 190327.4 | 59.23769 | 2.712554 | 15.33741 | 14.85793 | 7.854413 |

| 8 | 241323.9 | 61.06680 | 2.059113 | 14.60829 | 14.14787 | 8.117930 |
|---|----------|-------------|-----------------|-----------|----------------|---------------|
| 9 | 277992.0 | 55.82212 | 3.332976 | 12.20616 | 16.73293 | 11.90582 |
| 10 | 333187.4 | 56.40438 | 4.674613 | 9.149805 | 17.58471 | 12.18649 |
| Variance Decomposition of Internet User : | | | | | | |
| Period | S.E. | Total Guest | Tourism Arrival | Room Rate | Number Of Room | Internet User |
| 1 | 1.178205 | 14.75945 | 27.94355 | 0.197082 | 24.91914 | 32.18078 |
| 2 | 1.449532 | 10.98034 | 21.94627 | 14.24311 | 31.10361 | 21.72668 |
| 3 | 2.321291 | 10.43806 | 12.38455 | 38.96130 | 29.38219 | 8.833906 |
| 4 | 3.488189 | 26.92517 | 7.024480 | 40.42946 | 21.18783 | 4.433058 |
| 5 | 5.480715 | 45.22541 | 2.916891 | 31.08225 | 16.94660 | 3.828850 |
| 6 | 8.992414 | 55.76541 | 1.293122 | 24.42389 | 13.88996 | 4.627622 |
| 7 | 13.25630 | 57.32127 | 0.989415 | 22.40768 | 13.34704 | 5.934593 |
| 8 | 18.06578 | 58.22988 | 1.226406 | 19.45586 | 13.54321 | 7.544641 |
| 9 | 23.73448 | 59.94487 | 1.737242 | 15.65860 | 13.82876 | 8.830526 |
| 10 | 29.85243 | 59.88015 | 2.546704 | 12.60409 | 14.71196 | 10.25709 |

Source: author's processing

Table 7 shows the percentage of variance in Total Guests explained by each independent variable in a certain period. S.E. is the standard error of the regression model. Period 1 is the initial period, where the variance of Total Guests is 100% and there are no independent variables that have an influence. Period 2 to 10 is the next period, where the variance of Total Guests decreases and the independent variables begin to have an influence. Room Rate is the variable that has the most influence on Total Guests, because it has the highest percentage of variance among the other independent variables in almost all periods. This means that changes in room prices will affect the number of guests staying at the hotel.

Internet User is the second most influential variable on Total Guests, because it has a fairly high percentage of variance in the period 5 to 10. This means that the number of internet users in the area around the hotel also influences the number of guests staying at the hotel.

Tourism Arrival is the third most influential variable on Total Guests, because it has a variance percentage that increases from periods 2 to 10. This means that the number of tourists who come to the area around the hotel also influences the number of guests who stay at the hotel.

Number Of Rooms is the variable that has the least influence on Total Guests, because it has a relatively low percentage of variance and is not stable in all periods. This means that the number of rooms available in a hotel does not really affect the number of guests staying at the hotel.

Table 7 shows the percentage of variance in Tourism Arrivals explained by each independent variable in a certain period. S.E. is the standard error of the regression model. Period 1 is the initial period, where the variance of Tourism Arrival is 18.02162% and other independent variables have no effect. Period 2 to 10 is the next period, where the variance of Tourism Arrivals decreases and the independent variables begin to have an influence. Room

Rate is the variable that has the most influence on Tourism Arrivals, because it has the highest percentage of variance among the other independent variables in periods 3 to 10. This This means that changes in room prices will affect the number of tourists coming to Indonesia.

Internet User is the second most influential variable on Tourism Arrival, because it has a fairly high percentage of variance in the period 5 to 10. This means that the number of internet users in Indonesia also influences the number of tourists who come to Indonesia.

Total Guests is the third most influential variable on Tourism Arrivals, because it has a high percentage of variance in periods 1 and 2, but decreases in subsequent periods. This means that the number of guests staying at hotels in Indonesia influences the number of tourists coming to Indonesia in the initial period, but does not have much influence in the subsequent period.

Number Of Rooms is the variable that has the least influence on Tourism Arrival, because it has a relatively low percentage of variance and is not stable in all periods. This means that the number of rooms available in hotels in Indonesia does not really affect the number of tourists coming to Indonesia.

Table 7 shows the percentage of variance in Room Rate explained by each independent variable in a certain period. S.E. is the standard error of the regression model. Period 1 is the initial period, where the variance of the Room Rate is 30.70349% and other independent variables have no effect. Period 2 to 10 is the next period, where the variance of the Room Rate decreases and the independent variables begin to have an effect. Total Guests is the variable that has the most influence on Room Rate, because it has the highest percentage of variance among the other independent variables in periods 1 and 2, but decreases in subsequent periods. This means that the number of guests staying at the hotel influences room prices in the initial period, but does not have much influence in the later period.

Number Of Rooms is the second most influential variable on Room Rate, because it has a fairly high percentage of variance in periods 3 to 7, but decreases in periods 8 to 10. This means that the number of rooms available in a hotel also influences room prices, but the effect is decreases over time.

Tourism Arrival is the third most influential variable on Room Rate, because it has a low percentage of variance in periods 1 and 2, but increases in periods 3 to 6, and decreases again in periods 7 to 10. This means that the number of tourists coming to the area Hotel surroundings influence room prices, but the influence is unstable and depends on the period.

Internet User is the variable that has the least influence on Room Rate, because it has a relatively low percentage of variance and is not stable in all periods. This means that the number of internet users in the area around the hotel does not really affect the room price.

Table 7 shows the percentage of variance in Number Of Rooms explained by each independent variable in a certain period. S.E. is the standard error of the regression model. Period 1 is the initial period, where the variance of Number Of Rooms is 69.92418% and other independent variables have no effect. Period 2 to 10 is the next period, where the variance of Number Of Room decreases and the independent variables begin to have an influence. Room Rate is the variable that has the most influence on Number Of Room, because it has a high percentage of variance in period 1, but decreases in subsequent periods. This means that changes in room prices will affect the number of rooms available at the hotel in the initial period, but not as much in the subsequent period.

Total Guests is the second most influential variable on Number Of Rooms, because it has a low percentage of variance in period 1, but increases in periods 2 to 8, and decreases again in periods 9 and 10. This means that the number of guests staying at the hotel also affects the number of rooms available in a hotel, but the effect is unstable and depends on the period.

Internet User is the third most influential variable on the Number of Rooms, because it has a low percentage of variance in periods 1 and 2, but increases in periods 3 to 10. This means that the number of internet users in the area around the hotel also influences the number of rooms available in the hotel. hotel, and its influence grew larger over time.

Tourism Arrival is the variable that has the least influence on Number Of Rooms, because it has a very low percentage of variance and is not stable in all periods. This means that the number of tourists coming to the area around the hotel does not really affect the number of rooms available at the hotel.

Table 7 shows the percentage of variance of Internet Users explained by each independent variable in a certain period. S.E. is the standard error of the regression model. Period 1 is the initial period, where the variance of Internet Users is 32.18078% and other independent variables have no effect. Period 2 to 10 is the next period, where the variance of Internet Users decreases and the independent variables begin to have an effect.

Room Rate is the variable that has the most influence on Internet Users, because it has a high percentage of variance in periods 3 and 4, but decreases in the following periods. This means that changes in room prices will affect the number of internet users in Indonesia in the initial period, but will not have much influence in the subsequent period.

Number Of Rooms is the second most influential variable on Internet Users, because it has a high percentage of variance in period 2, but decreases in the following periods. This means that the number of rooms available in hotels also influences the number of internet users in Indonesia in the early period, but does not have much influence in the later period.

Total Guests is the third most influential variable on Internet Users, because it has a low percentage of variance in periods 1 and 2, but increases in periods 4 to 8, and decreases again in periods 9 and 10. This means that the number of guests staying at the hotel also affects the number of internet users in Indonesia, but the effect is unstable and depends on the period.

Tourism Arrival is the variable that has the least influence on Internet Users, because it has a very low percentage of variance and is not stable in all periods. This means that the number of tourists who come to the area around the hotel does not really affect the number of internet users in Indonesia.

5 CONCLUSION

Number Of Rooms is the most statistically significant variable in influencing all other variables, which reflects the capacity and quality of accommodation offered by the hotel. Therefore, hotels must increase the Number Of Rooms to attract more tourists and increase revenue. Other variables that are statistically significant in influencing several variables are Total Guests, Tourism Arrivals, and Room Rate, which reflect market demand and supply, as well as hotel competitiveness. Therefore, hotels must maintain and improve these variables with appropriate marketing strategies, such as promotions, distribution channels and social networks. The weakest variable in the VAR model is Internet User, which has a negative relationship with Total Guests, Tourism Arrivals, and Room Rate, which reflects the influence of information technology on consumer behavior. Therefore, hotels must pay attention to and utilize this variable in a positive way, such as providing good internet facilities, creating an attractive website, and optimizing online bookings. The number of hotel guests is influenced by shocks to the Tourism Arrival, Room Rate, Number of Rooms and Internet User variables. The number of hotel guests will decrease if there is a decrease in the number of tourists, an increase in hotel room prices, or an increase in the number of internet users. The number of hotel guests will increase if there is an increase in the number of hotel rooms. The response of the number of hotel guests to shocks to other variables varies in direction, magnitude, and duration. The number of tourists coming to Indonesia is influenced by shocks to the Total Guest,

Room Rate, Number of Room and Internet User variables. The number of tourists will decrease if there is an increase in the number of hotel guests, an increase in hotel room prices, or an increase in the number of internet users. The number of tourists will increase if there is an increase in the number of hotel rooms. The response of tourist numbers to shocks to other variables varies in direction, magnitude and duration. These results show that there is a trade off relationship between domestic tourists and foreign tourists in Indonesia. This trade off relationship means that if there is an increase in the number of domestic tourists, there will be a decrease in the number of foreign tourists, and vice versa. This can be caused by several factors, such as preferences, purchasing power, availability, and competition between domestic and foreign tourists. Hotel room prices are influenced by shocks to the Total Guest, Tourism Arrival, Number of Room and Internet User variables. Hotel room prices will decrease if there is an increase in the number of hotel guests, an increase in hotel room prices, or an increase in the number of internet users. Hotel room prices will increase if there is an increase in the number of hotel rooms. The response of hotel room prices to shocks to other variables varies in direction, magnitude, and duration. These results indicate that digital marketing can influence hotel room prices through these variables. Digital marketing is a marketing strategy that involves promoting products or services using digital technology such as the internet, social media, search engines, email, and mobile devices. Digital marketing can help hotels reach a wider audience, save costs and increase return on investment. The number of internet users is influenced by shocks to the Total Guest, Tourism Arrival, Room Rate and Number Of Room variables. The number of internet users will decrease if there is an increase in the number of hotel guests, an increase in hotel room prices, or an increase in the number of hotel rooms. The number of internet users will increase if there is a decrease in the number of tourists or hotel room prices. The response of the number of internet users to shocks to other variables varies in direction, magnitude and duration. These results indicate that hotel internet marketing can influence the number of internet users through these variables. Hotel internet marketing is a marketing strategy that uses digital technology such as websites, social media, search engines, email and mobile devices to promote hotel products or services in the online world. Hotel internet marketing can help hotels reach a wider audience, save costs, and increase return on investment.

THEORETICAL CONTRIBUTIONS

This research provides a theoretical contribution by examining the influence of the internet as an effective and efficient marketing medium for the hotel industry in Indonesia, which is a topic that has rarely been researched before. This research develops vector autoregression (VAR) theory with two lags to describe the relationship between five time series variables, namely Total Guests, Tourism Arrivals, Room Rate, Number Of Rooms, and Internet Users, which is an innovative and accurate method for analyzing secondary data from the World Bank and UNWTO. This research provides new insight into the trade off relationship between domestic tourists and foreign tourists, which can be influenced by factors such as preferences, purchasing power, availability, and competition, which is an interesting and important phenomenon for hotel industry players to know.

PRACTICAL CONTRIBUTION

This research makes a practical contribution by providing solutions for the hotel industry in Indonesia to increase performance and income by utilizing the internet as an effective and efficient marketing medium. This research provides recommendations for hotels to increase the Number of Rooms as the variable that has the most influence on other variables, which indicates the capacity and quality of hotel accommodation, as well as maintaining and increasing Total Guests, Tourism Arrivals, and Room Rate as variables that reflect the dynamics of market demand and supply, as well as hotel competitiveness, with the right marketing strategies, such as promotions, distribution channels and social networks. This research provides implications for hotels to pay attention to and utilize Internet Users as a variable that has a negative relationship with Total Guests, Tourism Arrivals, and Room Rate, which reflects the influence of information technology on consumer behavior, in a positive way, such as providing good internet facilities, create an attractive website, and optimize online ordering. This research provides suggestions for future researchers to conduct further research using primary data, other variables, or other methods relevant to this research topic, to obtain more valid and reliable results.

RESEARCH LIMITATIONS

This research is limited to the use of the internet as an effective and efficient marketing medium for the hotel industry in Indonesia. The reason for limiting this topic is because the internet is an information technology that is developing rapidly and has great potential to increase hotel performance and revenue. This research only focuses on five time series variables, namely Total Guests, Tourism Arrivals, Room Rate, Number Of Rooms, and Internet Users. The reason for limiting these variables is because these variables are considered to represent important aspects in the hotel industry, such as capacity, quality, demand, supply and competitiveness. This research uses secondary data from the World Bank and UNWTO regarding Internet users, Number of hotel rooms, Total guests, and Tourism arrivals from 2000 to 2022. The reason for limiting this data source is because this data is official and reliable data that can be accessed online and easy to analyze. This research uses the vector autoregression (VAR) method with two lags to test the relationship between time series variables. The reason for limiting this method is because this method is an innovative and accurate method for analyzing time series data with many variables and interactions between variables.

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