Incorporating Tourism into the Money-Demand Model in the Kingdom of Saudi Arabia from 2015 to 2023.

إدراج السياحة في نموذج الطلب على النقود في المملكة العربية السعودية خلال الفترة (2015 – 2023)

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Abstract:

The objective of the research is to model the demand for money and evaluate the influence of incorporating tourism variable into the money demand. It uses traditional econometric techniques and descriptive analytical methods. The findings indicate that income has a positive impact on money demand; a one-Riyal increase in income results in an average increase in money demand of 28.7 Riyals. Additionally, there is a negative impact of the interest rates on money demand; a one-unit increase in the interest rates leads to a 17090.16 Riyal increase in money demand. Furthermore, tourism has a significant negative impact on money demand; a one-Riyal increase in tourists' expenditure results in an average decrease in money demand of 0.98 Riyals. Inflation does not have a significant impact on money demand.

Key words: Money Demand, Income, Interest Rate, Tourism, Inflation, Saudi Arabia.

الملخص:

تهدف الدراسة إلى نمذجة الطلب على النقود وتقييم أثر إدراج السياحية في نموذج الطلب على النقود في المملكة. تستخدم الدراسة منهج البحث الوصفي التحليلي وتطبق تقنيات الاقتصاد القياسي التقليدية. تشير النتائج إلى أن للدخل أثر موجب على الطلب على النقود؛ وتؤدي زيادة الدخل بمقدار ريال واحد إلى زيادة في متوسط الطلب على النقود بمقدار 28.7 ريال. بالإضافة إلى ذلك، يوجد أثر سالب لأسعار الفائدة على الطلب على النقود؛ وتؤدي زيادة أسعار الفائدة بمقدار وحدة واحدة إلى زيادة في متوسط الطلب على النقود بمقدار 17090.16 ريال. علاوة على ذلك، للسياحة أثر سالب على الطلب على النقود؛ وتؤدي زيادة الإنفاق السياحي بمقدار ريال واحد إلى انخفاض في متوسط الطلب على النقود بمقدار 0.98 ريال. التضخم ليس له أثر دال إحصائياً على الطلب على النقود .

الكلمات المفتاحية: الطلب على النقود، الدخل، سعر الفائدة، السياحة، التضخم، السعودية.

1. INTRODUCTION

Money exists in many forms, such as coins, banknotes, credit cards, and digital currencies. The study defines money as a medium of exchange, a store of value, an instrument for delayed payment,

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and a unit of account, depending on its functions. These functions of money are important for the economy; therefore, money, as a medium of exchange, is essential for facilitating economic transactions and trade in the economy, as well as simplifying the process of purchasing and selling products and services, because people and firms do not demand money for its own sake; instead, they demand it because they need products and services. Furthermore, the ability of money to serve as a store of value enables the accumulation of wealth in monetary forms over time; however, this function is based upon the stability of money's value. Consequently, inflation influences the store-of-value function, which in turn motivates individuals and organizations to accumulate their wealth in assets. Additionally, the function of money as a unit of account allows individuals and businesses to measure products and services in terms of monetary units. Furthermore, money functions as a deferred payment instrument, which enables the purchase of goods and services on credit. Citing Adil et al. (2022), the new monetary economists emphasize the importance of the money-demand model in monetary policy, highlighting its function in influencing price levels and ensuring that it is not completely neglected. The research aims to examine the factors that influence money demand in Saudi Arabia, thereby allowing policymakers to employ income, interest rates, inflation, and tourism as economic and monetary instruments for improving economic stability.

1.1 The Problem of Research: Money serves an essential purpose in the economy, and it is difficult to conduct economic activities without it. Understanding the variables that drive money demand assists in model development and monetary policy in the Kingdom of Saudi Arabia. The Kingdom welcomes visitors from various destinations, who often bring their own currencies and change them to Saudi Riyals to meet their needs for goods and services within the Kingdom; this may have an impact on the Kingdom's demand for money. So, what is the effect of tourism on the demand for money? What is the relationship between income and the demand for money? How do interest rates affect the demand for money? What impact does inflation have on the money demand?

1.2 The Significance of Research: This research, from a theoretical perspective, gathers evidence and data that aid in building a model explaining money demand in the Kingdom. Therefore, it assesses theories of money demand in the application environment, enriches libraries, benefits students, and assists future research in this field by providing valuable information. Moreover, from a practical perspective, this research plays a significant role in identifying the most significant factors that influence money demand in Saudi Arabia. Consequently, it suggests recommendations to aid decision-makers in the implementation of a monetary policy that promotes monetary stability.

1.3 The Aims of Research: The aim of this research is to include tourism as an independent variable into the money demand model. The study also seeks to identify the most significant factors influencing the money demand in Saudia.

1.4 The Hypotheses of Research: The study investigates the following null hypotheses to tackle the research problem and answer the questions outlined in it. The first hypothesis: income has no statistically significant effect on money demand in the Kingdom. The second hypothesis is that the interest rates have no statistically significant effect on money demand in the Kingdom. The third hypothesis is that inflation has no statistically significant effect on money demand in the Kingdom. Finally, the fourth hypothesis is that tourism does not have a statistically significant effect on money demand in the Kingdom.

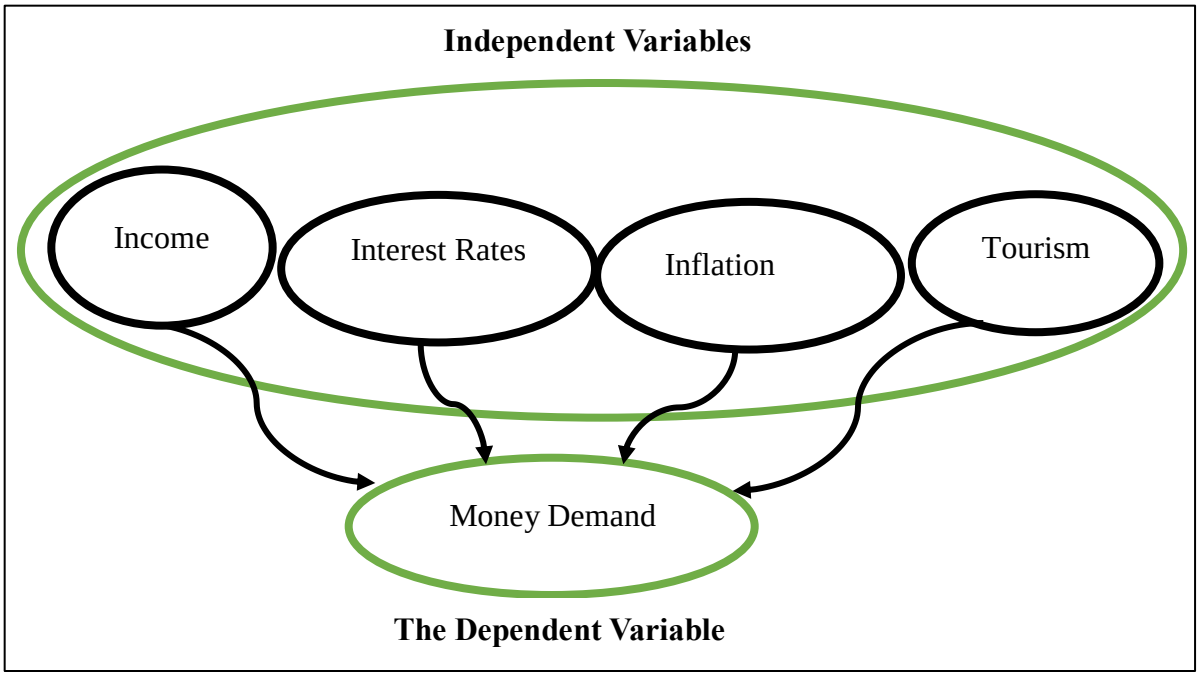
1.5 The Methodology of the Research: The research employs a descriptive-analytical methodology and a traditional econometric approach to model a multiple linear regression for money demand in Saudi Arabia. It constructs the model by referencing monetary theories and literature reviews. Additionally, it employs the E-Views program and applies the Ordinary Least Squares (OLS) method for estimating the parameters and evaluating the research hypotheses. Moreover, the research's secondary data sources are the General Authority of Statistics (2024), the Saudi Central Bank (2024), and the Ministry of Tourism (2024) in the Kingdom.

1.6 The Structure of Research: Section 1 comprises the introduction, which includes problem, aims, significance, hypotheses, methods, and structure of the research. In Section 2, it demonstrates the theoretical framework; it deals with the variables of research, which include money demand, income, interest rates, inflation, tourism, and literature reviews. Section 3 addresses the practical component, which includes model construction and parameter estimation. Section 4 presents the results and discussions. Section 5 deals with the conclusion, whilst Section 6 it demonstrates the bibliography list. Finally, it presents the appendices in Section 7.

2. THE THEORETICAL FRAMEWORK:

Figure (1) provides a classification for the research variables.

Figure 1: A Presentation of the Conceptual Farmwork of Research Variables.



Source: *Prepared by the researcher.*

Figure 1 depicts a conceptual farmwork of research variables, which provides a clear and quick understanding of how different independent variables influence the dependent variable. It constructs

the model according to hypotheses and research questions. The study anticipates that each independent variable will influence the money demand.

2.1 Money Demand:

Since in equilibrium there is no difference between money supply and money demand, they are interchangeable concepts. People and non-bank institutions hold the currency in circulation, which is the first component of the narrow money demand equation. The second component is demanding deposits. The study illustrates a narrow money demand (M1), as in Equation 1.

$M1 = C + D$ ….. (1)

where C signifies currency in circulation and D signifies demand deposits. M1 is considered to conduct transactions.

The symbol M2 designates the second definition of the demand for money, which includes the narrow M1 in addition to time deposits TD. The second definition is expressed in Equation 2 as follows:

$M2=C+D+TD$ …… (2)

The symbol M3 represents a border concept, the third definition of money demand. It includes the first and second definitions of money demand, in addition to certificates of deposit CDs. The study uses M3 to measure the demand for money, and Equation 3 illustrates M3 as follows:

$M3=C+D+TD+CDs$……. (3)

Quantity Theory of Money QTM: The classical theory of money is the quantity theory of money. In this theory, people demand money for transaction of goods and services. Ongan et al. (2022) assert that it is a fundamental element of monetarism, based on Irving Fisher's equation of exchange, established in 1911. Equation 4 represents quantity theory; the price level (P) multiplied by the real income (Y) is equivalent to the money stock (M) multiplied by the velocity of money (V).

$MV = PY$ ……. (4)

According to Lee and Andrian (2021), the most significant aspect of this theory is that interest rates do not impact money demand; they also emphasized that inflation is a monetary phenomenon, aligning with Melton Friedman's 1968 argument that increased money growth rates is the most significant cause of inflation.

Liquidity Preference Theory: John Maynard Keynes's theory of liquidity preference recognized speculation as an additional driver of money demand. Income positively influences the demand for money for transactional and precautionary purposes, but the interest rates negatively affect the demand for money for speculative reasons. A reduction in liquidity preference leads to an escalation in the relative monetary prices of assets, which encourages investment, creates chances for profit, and increases income through the multiplier (Oka, 2021). In this scenario, Yoon (2024) asks why people demand liquid assets; the reason is that expectations about interest rates changes will affect their money's value in the future. According to Levy-Orlik (2023), the liquidity preference theory is based on speculation, which plays a crucial role in the operation of the financial system. When interest rates are at their lowest, the demand for money rises dramatically, and people prefer to hold cash. This phenomenon is known as a liquidity trap.

Modern Portfolio Theory (MPT): To reduce risk, the investor creates a financial portfolio by diversifying the assets from which he expects a return. According to deLlano-Paz et al. (2023), Markowitz developed modern portfolio theory in 1952 for use in the finance sector. The primary goal of this theory was to evaluate various portfolios of financial assets, considering both expected return and associated risk.

2.2 The Income:

This study employs real GDP to represent income, which is the value of the final goods and services produced by the economy. The research uses real GDP instead of nominal GDP to measure the true value of products, given that nominal GDP is susceptible to price fluctuations. Real GDP is an important indicator of economic activity, serving as a gauge of economic development and welfare. The study anticipates a positive relationship between income, as an independent variable, and demand for money, which is significant for policymaking.

2.3 The Interest Rates:

The cost of borrowing money is the interest rate, and an increase in the interest rate stimulates depositors to put their money in banks to gain a return on their investment. With the increase in interest rates, the borrowing costs for consumers and investors are increased, thereby decreasing their capacity to borrow and the demand for money. Some individuals perceive interest as usury, a prohibited practice in Islam, and thus abstain from dealing in it. Al Rasasi and Banafea (2018) indicate that Islamic law prohibits the pursuit of interests. Based on the previously discussed concepts from modern quantity theory and liquidity preference theory, the analysis suggests that interest rates are expected to negatively impact the money demand within the Kingdom.

2.4 Inflation:

A sustained increase in the general level of prices that reduces the buying power of money is known as inflation. According to Moosa et al. (2024), inflation occurs when the economy creates more money than it needs to purchase goods and services, resulting in higher prices and a decrease in money's purchasing power. Al-Qudah (2019) asserts that the buying power of currency diminishes with rising inflation, resulting in an increased need for money to acquire goods and services. The study anticipates that inflation positively impacts money demand in the Kingdom.

2.5 Tourism:

According to the Ministry of Tourism (2024), inbound tourism refers to *the actions of a non-resident tourist going inside the nation of reference on an inbound tourism trip*. Tourism has become important to economies, increasing added value and income. According to Yuan and Alexander (2023), tourism can significantly reduce poverty in developing countries by improving infrastructure, accelerating human capital accumulation, promoting economic diversification, enhancing structural transformation, boosting domestic demand, creating job opportunities, and

generating foreign exchange. Chiu and Ding (2020) assert that tourism has seen rapid expansion due to its ability to provide jobs, enhance export earnings, and promote infrastructure development. Ping and Kaijun (2022) contend that family tourism will substantially influence the rise of domestic demand. The Kingdom of Saudi Arabia has several destinations for tourists that are attractive to both inhabitants and visitors, for example, Mecca, Medina, Riyadh, Abha, Jeddah, Tabuk, and Dammam.

2.6 Literature Review:

The researcher found that many studies on money demand have been undertaken by several people, such as Iftekhar et al. (2016) who used the ARDL technique to re-examine the factors influencing money demand in Pakistan. Their findings indicate that the real interest rate significantly influences the demand for money. Moreover, the rural populace and the exchange rate negatively impact the need for money. Edet et al. (2017) conducted an examination of the demand for money in Nigeria through the application of two distinct models. The first model incorporated income, interest rate, and predicted inflation rate as independent variables, while the second model included income, real rate of interest, and the asset holder's decision to allocate wealth into financial assets. The results showed that interest rate and inflationary expectation negatively influenced money demand; furthermore, money demand remained constant in Nigeria during the period under investigation. The study suggests that monetary authorities should prioritize interest rates over real interest rates to ensure monetary stability. Ali (2017) used the ARDL approach to evaluate the demand for money in Libya. He discovered that the nominal exchange rate and inflation rate elasticity were both negative; nevertheless, the real income elasticity coefficient was positive. Furthermore, he revealed that the money-demand function was stable from 1982 to 2010. Al Rasasi and Banafea (2018) estimate money demand in Saudi Arabia. They found that income elasticity was more than one (1.9), while the interest rate had no significant effect on domestic money demand. The real effective exchange rate had a significant negative impact on money demand. Mahmood and Alkhateeb (2018) examine the asymmetrical impacts of the real exchange rate on money demand in Saudi Arabia from 1968 to 2016. They used real income and inflation as independent variables, finding that real income and the exchange rate positively influence the demand for money, while inflation has a negative effect. Al-Qudah (2019) examines the factors that influence money demand in Jordan. He finds that while interest rates have a negative relationship with money demand, the inflation rate, real gross domestic product, and budget deficit have positive relationships. Finally, Hasanov et al. (2022) examined the money demand in Saudi Arabia under a fixed exchange rate regime. By including the exchange rate, they extended the basic model, which contains income, interest rate, and price variables. Their research demonstrated that a model of an open economy with country-specific factors is a more effective method of illustrating the money demand function in an economy with a fixed exchange rate.

Previous studies dealt with several independent variables that influence the demand for money, but they did not achieve the same outcomes. Instead, there are inconsistent findings, particularly in relation to the inflation variable. This is due to the differences in the study's application environment and periods.

Although studies have examined the demand for money, to the researcher's best knowledge, there is no study that has included tourism as an independent variable in the money demand model. As a

result, this study aims to fill this gap in previous research and assess the monetary theory in Saudi Arabia.

3. THE PRACTICAL ASPECT OF RESEARCH:

This section of the study focuses on modelling demand for money, relying upon the theoretical framework and literature evaluations presented in the previous part. The research subsequently develops a multiple linear regression model using the Ordinary Least Squares (OLS) approach and fulfils its conditions. Additionally, the study utilizes traditional econometric techniques to estimate parameters, as well as detecting and addressing econometric problems.

3.1 Building the Model:

Based on Figure (1), the research uses four independent variables: income, interest rates, inflation, and tourism to model money demand and examine the hypotheses. Table 3 displays the data for all factors in this research. Model 1 states the proposed linear regression model as follows:

$$MD_t=\beta_0+\beta_1 REALGDP_t+ \beta_2(I_t)+ \beta_3 IN_t+\beta_4 TOUR_t+\mu_t \quad \ldots.(1)$$

In Model 1, money demand (MD) serves as the dependent variable, while the explanatory variables include real GDP (income), interest rates (I), inflation (IN), and tourism (TOUR). Furthermore, the parameters β0, β1, β2, β3, and β4 represent the intercept, the income marginal propensity to money demand, the interest rates marginal propensity to money demand, the inflation marginal propensity to money demand and the tourism marginal propensity to money demand, respectively. Additionally, (t) denotes the time. Furthermore, (u) represents the random error term, which incorporates stochastic elements that impact money demand without explicit inclusion in the model.

Employing OLS in a multiple linear regression model requires that the error terms demonstrate the absence of autocorrelation across periods, absence of heteroscedasticity, and display no significant linear correlation among the independent variables. Failure to adhere to these assumptions can result in biased and inconsistent estimators, leading to spurious regression. Before estimating the parameters of OLS in E-Views, the study checks these assumptions. The OLS requirements are equivalent to the time series stationarity assumptions, which stipulate that time series variables must maintain a constant mean and variance over time, and no correlation between their error term in previous periods. According to Edet et al. (2017), the majority of time series data exhibit non-stationarity, which leads to the occurrence of spurious regression when analysing them. Furthermore, Conteh et al. (2022) employed OLS technique and conduct a stationarity test to exclude the unit root in the time series variable data, if it be present, since this may result in spurious equations.

The Unit Root Test: The study uses Augmented Dickey-Fuller (ADF). The following table shows the results of the test.

Table 1: Unit root test

Variables	Level	First difference	Second difference
	ADF	ADF	ADF
MD_t	-1.77	-4.39***	-
$REALGDP_t$	-2.58	-3.89**	-
I_t	-1.04	-2.07	-4.77***
IN_t	-2.74	-3.65**	-
$TOUR_t$	-1.67	-4.19**	-

****Significant at a probability level of 1%.* ***Significant at a probability level of 5%.*

***Source**: The researcher prepared this based on research data.*

According to Table 1, the ADF tests demonstrate that the level of all variables is statistically insignificant, indicating that the time series data has a unit root. The study achieves stationarity by computing the first difference for the variables MD_t, $REALGDP_t$, IN_t and $TOUR_t$, and the second difference for the variable I_t. Consequently, the investigation satisfies the assumptions of time series stationarity. One of the most noticeable econometric problems in time series variable data is autocorrelation, which the research avoids by incorporating a first-order autoregressive function $AR_{(1)}$ into Model 1 Dougherty (2011); Ahmed (2023). The study then obtains Model 2 as follows:

$$D(MD_t)=\beta_0+\beta_1 D(REALGDP_t)+ \beta_2 D(D(I_t))+ \beta_3 D(IN_t)+\beta_4 D(TOUR_t)+ AR_{(1)}+\mu_t \quad ....(2)$$

3.2 Estimating the Model's Parameters: Table 2 summarizes Model 2's estimation results.

Table 2: Model 2's results

Dependent Variable: $D(MD_t)$ in Model 2			
Variable	Coefficient	t-Statistic	Prob.
Constant	23017.99**	2.323055	(0.028)
$D(REALGDP_t)$	29.93965**	2.168143	(0.039)
$D(D(I_t))$	-16672.44***	-1.868377	(0.073)
$D(IN_t)$	-1299.552	-0.283009	(0.779)
$D(TOUR_t)$	-0.949725***	-1.920374	(0.065)
$AR_{(1)}$	0.396052**	2.151888	(0.041)
(R^2 = 0.26) (Adj R^2 = 0.13), (F-statistic =1.9269, Prop F = (0.12)), (DW = 2.08)			
(Inverted AR Roots=0.40), (ARCH Test=0.052, Prob = 0.82), (WHIT Test=4.71, Prob = 0.79)			
($VIF_{D(REALGDPt)}$=1.08) ($VIF_{D(D(It))}$=1.09) ($VIF_{D(INt)}$ = 1.08) ($VIF_{D(TOURt)}$ = 1.04)			

****Significant at a probability level of 5%.* ****Significant at a probability level of 10%.*

Source: *Prepared by the researcher*.

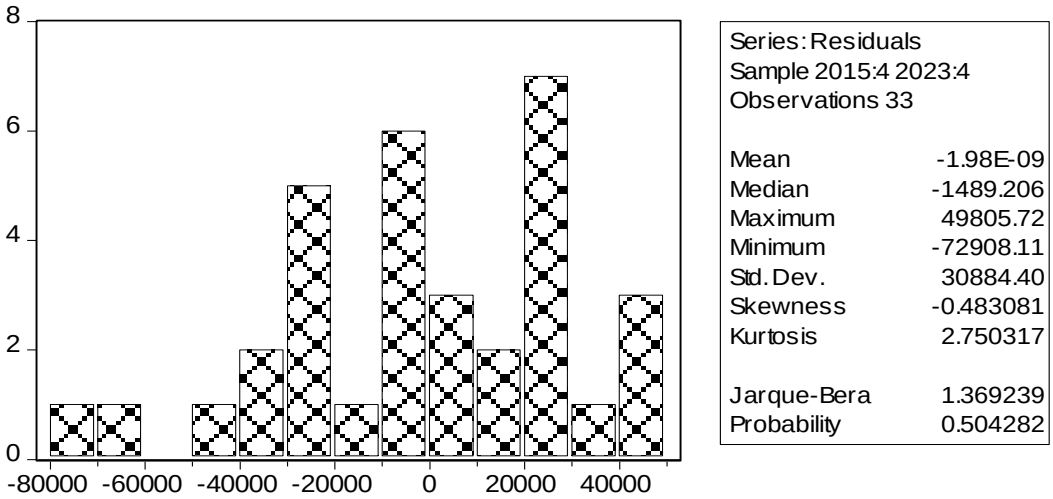
According to Table 2, the Durbin-Watson statistic (DW) value for testing the autocorrelation problem is close to 2, indicating no autocorrelation. Also, the (DW=2.08) value is greater than the upper tabular value (dL_4^{33}=1.193, du_4^{33}=1.730) at a 0.05 significant value; therefore, the research does not reject the null hypothesis, which argues that there is no autocorrelation problem in the model.

Table 2 shows that the ARCH test probability value for the heteroscedasticity problem is 0.82, greater than 0.05. So, the study does not reject the null hypothesis, which claims that there is no heteroscedasticity in Model 2. Moreover, the p value of the White test (0.79) for testing heteroscedasticity is greater than 0.05, confirming this result. Additionally, the study employs the White test to identify model misspecification problems, and the test's probability result indicates that the model has no misspecification problems or spurious regression. This implies that the model is appropriate for the data.

The study employs the variance inflation factor (VIF) to determine the existence of a significant linear connection between the independent variables. The data shown in Table 2 indicates that all VIF values are below 10. Therefore, the study does not reject the hypothesis that there is no high linear correlation.

To determine if the residuals have a normal distribution, the study uses the Jarque-Beraera test. Figure 1 illustrates the test's results.

Figure 1: Jarque-Bera for normally test



Source: *Prepared by the researcher.*

Figure 2 indicates that the Jarque-Bera statistic is equal to 1.37 and the probability value 0.50 is greater than 0.05, so the data are normally distributed.

Now the research has met the OLS requirements and the time series stationarity conditions. Model 2 is ready to use without any econometric problems or spurious regression. The equation that represents the estimated model for the investigation is as follows:

$$\mathbf{D(MD_t)=23017.99+29.9D(REALGDP_t)-16672.44D(D(I_t))-1299.55D(IN_t)-0.95D(TOUR_t)+\ 0.396AR_{(1)}...(3)}$$

4. RESULTS AND DISCUSSION:

In this part, the study assesses hypotheses and discusses the findings:

Testing the first hypothesis, which says income has no statistically significant effect on money demand in the Kingdom: $D(REALGDP_t)$ has a probability value of 0.039, which is less than the significant level of 0.05. As a result, the research rejects this hypothesis.

Assessing the second hypothesis, which postulates that the interest rates have no statistically significant effect on the money demand: Referring to Table 2, the probability value of $D(D(I_t))$ is 0.073, which is less than the significant value of 0.10. Consequently, the research rejects this hypothesis; the interest rates are found to have influenced the money demand.

Testing the third hypothesis, which posits that inflation has no statistically significant effect on money demand in the Kingdom. Table 2's information confirms that inflation does not significantly influence money demand, with a p-value of 0.77, greater than the 10% significance level.

The fourth hypothesis, which suggests tourism does not significantly affect money demand in the Kingdom, is rejected due to a p-value of 0.065, below the significance level of 0.10. The analysis suggests that tourism has a significant effect at a 10% significance level.

Table 2's results indicate that the F statistic test yields a probability value of 0.12, above the significance limit of 0.10. This result is due to the rejection of the null hypothesis regarding the impact of inflation on money demand. To address this issue, the study removes inflation from Model 2, converts it to Model 4, and then re-estimates the model. Table 6 in the appendices presents the results.

$$\mathbf{D(MD_t)=\ 22627.71+28.71D(REALGDP_t)-17090.16(D(I_t))-0.98D(TOUR_t)+\ 0.378AR_{(1)}...(4)}$$

Deleting inflation from Model 2 provides proof that the model's overall significance is now significant at 0.10 level as illustrated in Table 5. Moreover, Table 5 states that the adjusted R^2 value of 0.15 suggests that the explanatory variables are responsible for 15% of the overall variation in money demand.

5. CONCLUSION:

In conclusion, numerous studies have examined the money demand model in various countries; however, they have not examined the effect of tourism as an independent variable on the money demand. To bridge this gap, the researcher has incorporated tourism into the money demand model.

The study achieved stationarity by using the differences approach. Thus, the data became eligible for the Ordinary Least Squares method. Furthermore, the study examined the Model's econometric

problems and found that it did not have any autocorrelation, heteroscedasticity, multicollinearity, model misspecification, or spurious regression.

The study found that income positively affects money demand in Saudi Arabia; this result accords with the monetary theory, and consistent with that of Ali (2017); Al Rasasi and Banafea (2018); Al-Qudah (2019), indicating a similar trend across various times and nations. This result states that the income marginal propensity to money demand is 28.7, denoting a 1 riyal increase in income which results in an average rise in money demand of 28.7 Riyals.

The study also concludes that the interest rates adversely impact the demand for money. This finding is consistent with the monetary theory and in line with the findings of Al Rasasi and Banafea (2018); Edet et al. (2019). The outcome demonstrates that the interest rates marginal propensity to money demand is 17090.16. As a result, a one-unit increase in the interest rates leads to a 17090.16 Riyal decrease in money demand.

Additionally, the study demonstrated that inflation does not have a statistically significant impact on the demand for money in Saudi Arabia. Consequently, the study deleted it from the model.

Furthermore, the research revealed that tourism, as an independent variable, has a negative relationship with money demand in Saudi Arabia, and the tourism marginal propensity to money demand is approximately -0.98, stating that a 1 Riyal increase in tourists' spending leads to an average decrease in money demand of about 0.98 Riyal. This result contradicts research anticipation. This could potentially be the result of some tourists changing their local currency to Saudi Riyals in their countries before their arrival in the Kingdom.

The significance of this research is that it emphasizes the factors that influence money demand in Saudi Arabia, thereby allowing policymakers to employ income, interest rates, and tourism as economic and monetary instruments for fostering economic stability.

To conduct further research, this study recommends the expansion of the scope of research to examine momentary theory in Gulf Cooperation Council countries by renaming it "*Incorporating the Tourism Variable into the Money Demand Model in the Gulf Cooperation Council Countries*." Additionally, this study's findings indicate that policymakers in Saudi Arabia should consider income, interest rates, and tourism, as these factors significantly influence money demand and are essential for achieving economic stability and helping monetary policy decisions.

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7. Appendices:

Table (3): The Research's Data (in million Ryals)

Time (t)	Money Demand (MD)	Tourism (Tourists' Spending)	Inflation (IN) 2018=100	Real GDP=GDP/P	Interest Rate (I)
2015_{Q1}	1799358.577	23705.601867	96.0	6819.895833	0.8162
2015_{Q2}	1830948.931	19337.504199	96.2	6781.049896	0.77393
2015_{Q3}	1838959.456	23131.913534	96.6	6416.335403	0.82823
2015_{Q4}	1785582.063	16324.762333	97.0	6017.536082	1.1004
2016_{Q1}	1788774.945	28930.061765	98.4	6038.628048	1.71576
2016_{Q2}	1783600.185	22198.282539	98.5	6326.670050	2.07285
2016_{Q3}	1766190.078	23465.170478	98.6	6339.208924	2.28060
2016_{Q4}	1799707.684	18829.319862	98.2	6670.835030	2.19546
2017_{Q1}	1792073.298	21467.080577	97.8	6726.768916	1.88652
2017_{Q2}	1832865.559	22988.971294	97.9	6644.668028	1.74101
2017_{Q3}	1786426.745	32480.819084	97.8	6843.047034	1.79461
2017_{Q4}	1805171.373	20841.538159	96.9	7260.980392	1.82451
2018_{Q1}	1795218.267	18977.762506	100.7	7440.307845	1.9542
2018_{Q2}	1816208.972	16882.218352	100.2	7969.820359	2.41453
2018_{Q3}	1837921.19	35439.04472	100.0	8015.71	2.6192
2018_{Q4}	1853645.372	22178.608183	99.0	8336.404040	2.81599
2019_{Q1}	1829082.545	21518.347979	97.5	7750.328205	2.93428
2019_{Q2}	1882261.896	20433.549405	97.5	8084.564102	2.82156
2019_{Q3}	1887450.911	41420.355299	98.2	8009.052953	2.51383
2019_{Q4}	1985139.452	19981.61381	98.4	8274.664634	2.25769
2020_{Q1}	2009043.038	17612.34792	98.6	7324.411764	1.88620
2020_{Q2}	2051563.12	196.077987	98.5	6074.324873	1.12792
2020_{Q3}	2088013.143	488.993816	104.1	6721.123919	0.916
2020_{Q4}	2149267.067	1803.321269	104.0	7051.346153	0.83903
2021_{Q1}	2187305.422	948.199121	103.9	7176.881616	0.80722
2021_{Q2}	2238786.666	1303.97333	104.1	7463.131604	0.79367
2021_{Q3}	2262398.531	1962.02836	104.5	8159.349282	0.79622
2021_{Q4}	2308819.955	3042.65178	105.1	8590.333016	0.84283
2022_{Q1}	2371990.755	7925.935522	105.5	9283.867298	1.36461
2022_{Q2}	2438990.514	12217.025585	106.5	10218.98591	2.71460
2022_{Q3}	2465792.714	19525.491368	107.6	9899.897769	3.14085
2022_{Q4}	2495372.016	16607.469399	108.3	9456.546629	5.28157
2023_{Q1}	2608319.473	22279.588418	108.7	9304.783808	5.49488
2023_{Q2}	2660555.762	12967.9011 15	109.4	8944.122486	5.83009
2023_{Q3}	2663325.825	35265.981031	109.7	9086.900638	6.08893
2023_{Q4}	2685343.226	16899.296917	110.0	9242.6	6.30784

Source: *Prepared by the researcher according to data of the General Authority for Statistics (2024), Saudi Central Bank (2024), and the Ministry of Tourism (2023).*

Table 4: Model (2) E-Views Output

Dependent Variable: D(MD)				
Method: Least Squares				
Date: 09/04/24 Time: 12:38				
Sample(adjusted): 2015:4 2023:4				
Included observations: 33 after adjusting endpoints				
Convergence achieved after 9 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	23017.99	9908.500	2.323055	0.0280
D(REALGDP)	29.93965	13.80889	2.168143	0.0391
D(D(I))	-16672.44	8923.486	-1.868377	0.0726
D(IN)	-1299.552	4591.911	-0.283009	0.7793
D(TOUR)	-0.949725	0.494552	-1.920374	0.0654
AR(1)	0.396052	0.184049	2.151888	0.0405
R-squared	0.262999	Mean dependent var		25647.99
Adjusted R-squared	0.126517	S.D. dependent var		35975.35
S.E. of regression	33622.68	Akaike info criterion		23.84675
Sum squared resid	3.05E+10	Schwarz criterion		24.11885
Log likelihood	-387.4715	F-statistic		1.926987
Durbin-Watson stat	2.080234	Prob(F-statistic)		0.122697
Inverted AR Roots	.40			

Source**:** *Prepared by the researcher according to E-Views analysis of the data in Table 3*

Table 5: Model (3) E-Views Output

Dependent Variable: D(MD)				
Method: Least Squares				
Date: 11/16/24 Time: 12:22				
Sample(adjusted): 2015:4 2023:4				
Included observations: 33 after adjusting endpoints				
Convergence achieved after 6 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22627.71	9355.278	2.418710	0.0223
D(REALGDP)	28.70918	13.12732	2.186980	0.0373
D(D(I))	-17090.16	8740.245	-1.955341	0.0606
D(TOUR)	-0.982649	0.476030	-2.064260	0.0484
AR(1)	0.377988	0.179599	2.104616	0.0444

R-squared	0.261002	Mean dependent var	25647.99
Adjusted R-squared	0.155431	S.D. dependent var	35975.35
S.E. of regression	33061.51	Akaike info criterion	23.78885
Sum squared resid	3.06E+10	Schwarz criterion	24.01560
Log likelihood	-387.5161	F-statistic	2.472283
Durbin-Watson stat	2.068379	Prob(F-statistic)	0.067427
Inverted AR Roots	.38		

Source*: *Prepared by the researcher according to E-Views analysis of the data in Table 3