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The impact of tourism sector variables on economic growth in the Kingdom of Saudi Arabia during the period 2010-2020

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Abstract: This study examines the influence of tourism sector variables on economic growth in the Kingdom of Saudi Arabia from 2010 to 2020. Employing a descriptive theoretical framework and an analytical approach, the research employs GARCH models to assess the impact of tourism revenues, general revenues, and investments in the tourism sector on economic growth. Through diagnostic tests, the findings reveal significant correlations: firstly, a positive relationship exists between tourism revenues and economic growth; secondly, a positive correlation is observed between general revenues and economic growth; thirdly, there is a positive correlation between investments in the tourism sector and economic growth. Moreover, the study underscores the explanatory capacity of tourism sector variables in economic growth and the predictive accuracy of the estimated model in forecasting economic growth via tourism sector variables in Saudi Arabia. Consequently, these results offer valuable insights for analysis, policy evaluation, and economic decision-making within the Saudi Arabian tourism sector. The study provides recommendations including comprehensive analysis of internal and external tourism environments to identify strengths, weaknesses, opportunities, and threats; attention to the quality of tourist services to reflect the cultural and humanitarian values of Saudi Arabia; and enhancing collaboration with institutions supporting tourism activity such as transportation, healthcare, education services, and border control agencies.

Keywords: Economic growth, Tourism revenues, public revenues, Investments in the tourism sector.

تأثير متغيرات قطاع السياحة على النمو الاقتصادي في المملكة العربية السعودية خلال الفترة 2010-2020

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المستخلص: تهدف هذه الدراسة إلى فحص تأثير المتغيرات في قطاع السياحة على النمو الاقتصادي في المملكة العربية السعودية خلال الفترة من عام 2010 إلى عام 2020. باستخدام إطار نظري وصفي ونهج تحليلي، تستخدم الدراسة نماذج GARCH لتقييم تأثير إيرادات السياحة والإيرادات العامة والاستثمارات في قطاع السياحة على النمو الاقتصادي. من خلال الاختبارات التشخيصية، تكشف النتائج عن علاقات معنوية: أولاً، هناك علاقة إيجابية بين إيرادات السياحة والنمو الاقتصادي؛ ثانياً، يُلاحظ ترابط إيجابي بين الإيرادات العامة والنمو الاقتصادي؛ ثالثاً، هناك ترابط إيجابي بين الاستثمارات في قطاع السياحة والنمو الاقتصادي. علاوة على ذلك، تؤكد الدراسة قدرة المتغيرات في قطاع السياحة على تفسير النمو الاقتصادي ودقة النموذج المقدر في توقع النمو الاقتصادي من خلال المتغيرات في قطاع السياحة في السعودية. وبناءً على ذلك، تقدم هذه النتائج رؤى قيمة للتحليل وتقييم السياسات واتخاذ القرارات الاقتصادية داخل قطاع السياحة السعودي. تقدم الدراسة توصيات تشمل التحليل الشامل للبيئات السياحية الداخلية والخارجية لتحديد القوى والضعف والفرص والتهديدات؛ الانتباه إلى جودة خدمات السياح لعكس القيم الثقافية والإنسانية للمملكة العربية السعودية؛ وتعزيز التعاون مع المؤسسات الداعمة للنشاط السياحي مثل النقل والرعاية الصحية وخدمات التعليم ووكالات مراقبة الحدود.

الكلمات المفتاحية: النمو الاقتصادي، إيرادات السياحة، الإيرادات العامة، الاستثمارات في قطاع السياحة.

1- Introduction:

British archaeologist and explorer Charles Doughty wrote about tourism in the Kingdom of Saudi Arabia upon his travels through the Arabian Peninsula in the early twentieth century. He He reflected That on the global, the growth in tourism continued during the seventies and eighties, with an intense increase in the development of hotels, resorts, and other tourism infrastructure. However, Saudi Arabia has worked hard to revive the tourism industry and has also launched a number of initiatives designed to promote tourism, including creating new tourism attractions, developing infrastructure, and promoting local culture and heritage. Saudi Arabia has a wealth of attractions for visitors and it has a rich cultural heritage, growing tourism industry and has worked hard to develop its tourism industry. Local tourism has observed stages of development until it has become an organized sector supported by regulations, systems, projects and programs. The Kingdom's Vision 2030 emphasized the importance of the tourism sector to be one of the most important economic revenues and for its contribution to the gross domestic product to diversify the base of the national economy. attracting investments, increasing sources of income, and providing job opportunities for citizens. The tourism system includes: (the Ministry of Tourism, the Tourism Development Fund, and the Saudi Tourism Authority), whose its roles are integrated to implement the national tourism strategy and achieve the ambitions and goals of the sector. Among its objectives, the digital tourism strategy seeks to simplify travel procedures and plans towards launching a unified platform linking tourism service providers and their applications, which is expected to be completed in 2025. Seeking to raise awareness of local tourism in Saudi Arabia to enhance its position in the world, and launching campaigns to promote domestic tourism to contribute to raising number of visits to the area. It is hoped that it will achieve greater and broader development of the tourism sector. The tourism and entertainment sector in the Kingdom observed unprecedented growth and has actually achieved qualitative leaps, which reflects the interest of the wise leadership that supports and follows up this new movement in providing the infrastructure and financial as a cultural attraction for tourism with outcomes that enhance the attraction of investments, as the ministry of tourism adopts many qualitative and initiatives programs. Looking forward to the tourism sector and its growth with the Kingdom's status, values and role in human civilization and its influence on the international community, as it is an important tributary of the national economy. The ministry of tourism is considered as the first government agency in the Middle East and Africa to obtain international accreditation for the quality of systems and electronic services provided to beneficiaries in applying the best administrative practices in the field of quality of electronic systems and services.

2- The problem statement

Increasing tourism flows, digital transformation of regions and technological innovations in Saudi Arabia The future of tourism will depend on how the Kingdom responds to future environmental, social and economic challenges.?

3- Research questions.

- What is the nature of the relationship between tourism revenues and economic growth?
- What is the nature of the relationship between public revenues and economic growth?
- What is the nature of the relationship between the size of tourism investments and economic growth?

4- The relevance of the research

The relevance of the study lies in the fact that tourism has a great impact in creating job opportunities for many Saudi youth through the establishment of many tourist facilities and small commercial projects to meet the requirements of tourists and expatriates to the Kingdom of Saudi Arabia. Tourism in Saudi Arabia has also contributed to promoting sustainable and social development. The practical importance of this study comes to reach the best standard model to measure the relationship between the variables of the study through the application of the latest methodologies to measure relationships in both the short term and the long term, which is represented in the methodology of (GARCH) models, in order to benefit from this relationship in the service of economic decision-makers in developing the appropriate economic policy for investment in the Kingdom of Saudi Arabia.

5- The objectives of the research

The study Aiming to:

The extent to which the variables of the tourism sector affect the economic growth in the Kingdom of Saudi Arabia during the period (2010-2020)

6- Study hypotheses

The study contains a number of hypotheses

1. The existence of a statistically significant positive relationship between tourism revenues and economic growth in the Kingdom of Saudi Arabia during the study period.
2. The existence of a statistically significant positive relationship between public revenues and economic growth in the Kingdom of Saudi Arabia during the study period.
3. The existence of a statistically significant positive relationship between the volume of tourism investments and economic growth

7- Study Methodology

The study depends on the descriptive analytical approach, where the descriptive aspect is used in graphs and descriptive statistics of Impact of tourism on economic growth in the Kingdom of Saudi Arabia During the period (2010-2020 while the standard aspect is used in building mathematical models to analyze the results to prove the study's hypothesis and the accuracy of its predictions. Through the use of GARCH models

8- Data sources:

The study relied on secondary data obtained from reports for different years, by the General Authority for Statistics, the Ministry of Investment, the Ministry of Tourism in the Kingdom of Saudi Arabia and some websites

9- The scope of the research

This research analyzes the impact of tourism on economic growth in the Kingdom of Saudi Arabia During the period (2010-2020)

10- Literature Review

- Study by Mashael Abdulrahman Alsaqabi 2022

This study aimed to find out the effect of of the Hajj season as part of the tourism sector in Saudi Arabia on economic growth. Based on the ARDL test and Granger causality test from 1980 to 2018. The variables of study include the real non-oil GDP as an indicator of economic growth, the number of pilgrims from inside and the number of pilgrims from outside as representing indicators of Hajj season, and the Real effective exchange rates of Saudi Riyal consider important variables for affecting international tourism and its relationship with real income. The results show the existence of the counteraction between the variables. The variable of pilgrims from outside is considered a significant positive predictor for non-oil GDP. Moreover, there is a unidirectional Granger causality flow from the pilgrims from outside to real non-oil GDP, and unidirectional causality that runs from the real effective riyal exchange rates to real non-oil GDP. This study supports the consensus that the Hajj season acts as an engine of economic growth for Saudi Arabia during the estimation period, depending on the analysis result of the pilgrims from outside and the Real Effective Riyal Exchange rates. While the revenues of Hajj based on the pilgrims from inside may have only an effect on the private sector and not in the state treasury and do not represent great of the GDP as economists pointed out. Also, this study supports the Saudi Vision 2030, which set a clear goal to raise the capacity of the guests of Rahman, which will reach 30 million Pilgrims and Umrah pilgrims by 2030

- Study by Kajenthini Ganeshamoorth2019

This study attempts to investigate the relationship between tourism and employment creation in Sri Lank during the period of 1977-2017by employing econometric techniques namely the Johansen counteraction test, Vector Auto-Regressive (VAR) analysis, and Granger-causality test. Johansen integration test was used to find the long-term association between tourism and employment creation and found that the absence of a long-run relationship between two indicating tourism would not determine the employment creation in the long-term. Furthermore, the Granger causality test was employed for investigating the short-term relationship and it

confirmed the existence of unidirectional causality between tourism and employment creation showing that the tourism industry of Sri Lanka would lead to employment generation in the short term.

- Study by Nasir Selimi -Murat Sadiku 2017

The purpose of this research paper is to empirically analyse the effects of tourism on economic growth in Western Balkan countries (Albania, Bosnia and Herzegovina, Croatia, FYROM, Montenegro and Serbia). Design/Methodology/Approach: The empirical analysis consists of 17-year panel data of 6 countries over the period 1998 to 2014. Several models are analysed using the panel regression econometric techniques. The study investigates the random and fixed effects, as well as individual heterogeneity across those countries. Also, the Hausman Taylor IV estimator is used as the most appropriate model for this analysis. The real income per capita of the sample countries is modelled as dependent on the lagged income per capita, tourist arrivals, tourism receipts, FDI stock, exports and government expenditures. Findings: The estimation results in all types of models, and indicate that tourism has a positive and significant impact on economic growth in the Western Balkan countries. The Hausman Taylor IV model suggests that for every 1% increase of tourist arrivals, the output will increase approximately by 0.08%. Research Limitations/Implications: Although the Hausman Taylor IV model performs well, the results should be interpreted with caution. The analysis has its limitations; firstly, the total number of observations is relatively small for a panel regression analysis; secondly, the problem of endogenity is not completely avoided. However, the study implies that these countries should enhance efforts for joint tourism sector policies to engender economic sustainability.

- Study by Mohammed Al Yousif, Ahmed Al Bakr-2017

This study aimed to effect To estimate the effect of the tourism sector on output, income, and employment, Leontief's input-output analysis (I-O) is carried out. This paper found that increasing investment in the Saudi tourism sector can have a significant influence on solving less diversified economy and higher rate of unemployment. The tourism industry can have positive direct and indirect economic effects. The direct effect mostly comes from tourism activities. Other sectors of production such as services, construction, and manufacturing bring about the indirect economic effect. In sum, increasing investment in the tourism sector as an approach to enhancing Saudi economic diversification is entirely in line with the Vision 2030 objectives.

- Study Kamal Raj Dhungel (2015)

A sector potential to carry Nepal in a new economic dimension is tourism. To ensure this to happen, this study tries to examine the relationship between tourism earning and economic growth during the period 1974-2012. Econometric tools such as unit root, co-integration, and error correction are used to examine the equilibrium position. In spite of the low contribution in economic growth, a share of 2% only is a present status; empirical findings reveal a robust fact that a unit change in tourism income will change the gross domestic product by 8.79 units with tourism income elasticity coefficient of 0.2. The causality analysis suggests that there is no short run causality running from either way. However unidirectional causality exists running from gross domestic product to tourism earning in the long run. This study has single implication which advises policy makers of Nepal that they should devise strategies to attain the causality running from tourism to economic growth. It ensures to attain the tourism led-economic growth. In addition, it indicates the speed of adjustment of previous level disequilibrium. The system would correct this at the speed of 39% annually to come at the steady state. These are the self-evident fact that tourism sector has a large potentiality to contribute to economic growth.

- Study by kobra under 2008

the aim of this study is to test whether there is a long-term relationship between tourism and employment, and to display the possible contribution ofthe sector to employment. In this paper, annual time series data regarding tourism revenues of 1980-2006 period are examined using Engle-Granger causality test, Johansen co-integration approach and error correction modeling. . The empirical findings obtained as a result of VAR indicates that tourism has a positive effect on employment while the co-integration test indicates that there is a long-term correlation between the two variables

Theoretical framework

Tourism in the Kingdom of Saudi Arabia:

Saudi Arabia is the second largest tourist destination in the Middle East with more than 16 million people visitors in 2017. Although most tourism in Saudi Arabia still largely involves Hajj trips, there is growth in the leisure tourism sector. Since the tourism

sector has been greatly enhanced in recent times, it is expected that it will be as white petrol for Saudi Arabia. This has been proven as the tourism sector generates $25 billion in 2019. Potential tourist areas include Hijaz Mountains, Sarawat, diving in the Red Sea, and a number of ancient archaeology . (Wikipedia Tourismin Saudi Arabia https://en.wikipedia.org/wiki/Main_Page)

The tourism sector, recognized as a promising economic sector, is critical to diversifying sources of income in Saudi Arabia and achieving the goals of Saudi Vision 2030. The National Tourism Strategy was launched to promote the development of the sector, with the aim of creating 1 million New jobs and increase their contribution to GDP from the current 3.8% to 10% by 2030 The strategy focuses on attracting 100 million tourists by 2030, both by enticing foreign tourists and encouraging domestic tourists to explore the Kingdom rather than traveling abroad. Saudi Arabia is already the largest global investor in the tourism sector, with investments projected to reach $810 billion by the end of the decade, according to the investment (Annual Report on the State of the Saudi Economy | 1444 AH – 2022)

The development and interest of tourism:

The most important economic characteristic of tourism-related activities is that they contribute to the achievement of three high-priority objectives for developing countries: income generation, employment and foreign exchange earnings. In this regard, the tourism sector can play an important role as a driving force for economic development. The impact that this industry can have at different stages of economic development depends on the specific characteristics of each country. Due to the complexity of tourism consumption, its economic impact is widely evident. in other sectors of production, contributing in each case to the achievement of accelerated development goals. One of the main difficulties in determining the boundaries of the tourism sector is to ascertain the investment costs that should be attributed to the development of tourism. Although international agencies are not yet treated as a "sector" in national accounting terminology, tourism involves a range of goods and services that are provided specifically to visitors and that could not otherwise be offered. Because of its interdependence with other sectors of the economy, tourism is difficult to analyze and plan. The lack of reliable statistical data hinders the identification of the mechanisms through which tourism achieves growth, as well as its potential for development. However, in those cases where analysis and research were carried out prior to planning, tourism was prioritized in competition for scarce investment funds. In these cases, long-term tourism development programs are designed. The development of natural and heritage tourism has investment needs that differ in some respects from the development of traditional tourist hotels. There may be a greater need to improve access to the attraction site or facility, organization of Amercan states (2023

Tourism development is an important growth engine for the future of Saudi Arabia. It is one of the main basics center of the Vision 2030 plan to help economy diversify and reduce dependence on oil. The Ministry of Tourism, the Saudi Tourism Authority and the Tourism Development Fund were established in line with international best practices and with clear missions to support the growth of this important sector and help it to be flourished Saudi Tourism Authority -(Saudi Tourism Authority.2023) In Vision 2030, Saudi Arabia focused on opening up to the world and planned investments worth $810 billion in culture, entertainment and amusement projects over the next decade. This strategy has already significantly enhanced the country's attractiveness as a tourist destination. It is already making progress towards its goal of welcoming 100 million visitors to the country by 2030. Saudi Arabia has already seen significant growth in its hospitality and tourism sectors over the past five years, making significant progress well ahead of the 2030 target. Top hospitality brands have launched more than 20 hotels. The country is already met amazing standards. In 2019, Jeddah showed the highest average daily revenue worldwide. In the first half of 2019, hotel occupancy rates increased in three cities: Mecca, Riyadh, and Dammam. These indicators and others give a positive outlook for the tourism and hospitality sector in Saudi Arabia in the future. Saudi Arabia's major investments in tourism and brands developing hotels and entertainment venues will create many job opportunities in the hospitality and tourism sectors. This is exciting growth that increases global job opportunities in these industries and diversifies job opportunities for Saudis. Many young Saudis - Could Saudi Arabia Become the Next Tourism Leader in the Middle East? (Sacha Poncet- 2023). The World Travel and Tourism Council expects the travel and tourism sector in Saudi Arabia to grow at a rate of 11% annually over the next decade, making it the fastest growing travel and tourism sector in the Middle East. The Kingdom expects the sector's total contribution to reach 635 billion Saudi riyals in 2032, constituting approximately 17.1% of the gross economic in domestic product. The data shows the economic importance of tourism in the Kingdom. Travel and tourism will become a momentum for the Saudi economy due to high levels of investments and support. According to WTTC, Saudi Arabia is expected to exceed the set goals of the Vision 2030 blueprint.(Zabada N. Abouelhana, 2022)

Objectives of tourism development in the Kingdom of Saudi Arabia:

It is important for resource-rich countries to economically diversify to mitigate the resource curse. The Kingdom of Saudi Arabia recognizes the importance of economic diversifying and actively benefiting from tourism activity as the main mover for achieving this goal, as well as tourism marketing. The strategy plays a crucial role in the successful implementation of a thriving tourism sector that raises awareness and attracts visitors. The Kingdom of Saudi Arabia is seeking this and is making great efforts to make its position as an attractive destination (Rasiya Nazir.2023 p198).

Tourism sector strategy in the Kingdom of Saudi Arabia:

In February 2022, the Kingdom launched the Digital Tourism Strategy, designed to achieve the next phase of the sector's expansion and development, and accelerate progress towards the goals of the National Tourism Strategy. The strategy aims to implement flexible digital and technological procedures across the sector in order to provide tourists and concerned people with more seamless experience. The strategy focuses on a number of fields, including enhancing the culture of innovation and future systems across the Kingdom, pioneering new digital business models to increase market demand for service providers, brush up and rehabilitating the skills of the country's tourism workforce. The strategy consists of nine programs and 31 initiatives scheduled to be implemented over three years. (Hassan Rafik, 2023)

Tourism investment:

Direct general investment in tourism is completed – either in exclusively general business or through participation in "mixed communities", as is the case, for example, in North Africa – operations must take place under normal commercial conditions so that businessmen in the private sector do not feel that they are in a critical situation. The defect is in confronting state authority. The first essential is that if a general institution is established, it must be independent from the Ministry of Tourism or the National Tourism Office, and from all other general agencies. Furthermore, the public company must be obligated to cover all interest charges and depreciation savings, and must be subject to the same administrative regulations as a private hotel company for government regulation. Private investment inevitably occurs against the backdrop of various types of government regulation. Government regulation can be a positive force for creating a favorable investment climate. However, it should not feel cumbersome or arbitrary. They should be established in consultation with the tourism trade sector, and self-regulation should be encouraged wherever possible. (David Davis .1967,).

Economic growth

Economic growth is one of the most important economic indicators, and it is defined as the sum of the added values to all production units operating in the different branches of production in a given economy, such as agriculture, mining, industry, tourism and others.(Economic growth .2008) Aggregate economic growth is measured by the gross national product (GNP) or gross domestic product (GDP), although alternative measures are sometimes used. (The Investopedia Tesm .2023) Estimates of economic growth are essentially a reflection of estimates of the size of output in the economy, as economic growth is the annual relative change in the size of output (maryam musaeiduh.2023) https://mawdoo3.com

Table No. (1) shows The Relationship Between Economic growth And Tourism revenues

RVT	GDP	Year
111911988	1980777	2010
111920988	2517146	2011
115961969	2759906	2012
119135895	2799927	2013
121149055	2836314	2014
124914581	2453512	2015
127632082	2418508	2016
118725764	2582198	2017
124136878	2949457	2018

RVT	GDP	Year
197856000	2973626	2019
124930200	2637629	2020

Source prepared by the researcher from the main table of the study

Table (1) shows that the GDP in the Kingdom of Saudi Arabia was stable during the period 2010-2014 and then began to decline at an accelerated pace and takes a gradual pattern low during the period 2017-2019 The growth rate in GDP decreased by 4.1% in 2020 compared to 2019. This is due to the contraction of the oil sector by 6.7%, in addition to the negative growth rate in the non-oil sector by 2.3%. The private sector contracted by 3.1%, and the government sector showed negative growth.

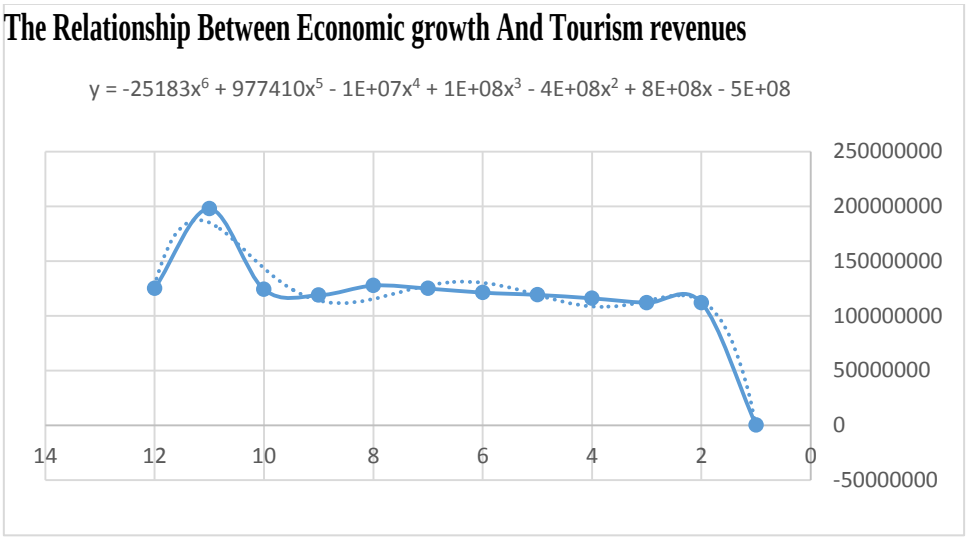


Figure No (1) shows

- the Relationship Between Economic growth And Public revenues

Table No. (2) shows The Relationship Between Economic growth And Public revenues

TRV	GDP	Year
740872	1980777	2010
1117527	2517146	2011
1246538	2759906	2012
1152612	2799927	2013
1040141	2836314	2014
612693	2453512	2015
519448	2418508	2016
691505	2582198	2017
905609	2949457	2018
926845	2973626	2019
781834	2637629	2020

Source prepared by the researcher from the main table of the study

Table No. (2) shows that Public revenues in the Kingdom of Saudi Arabia during the period from 2011-2014 are almost stable due to the increase in oil export revenues during this period and the change was slight and unnoticeable Revenues decreased in 2015-2016-2017 due to the decline in oil prices, which led to a budget deficit Revenues increased in 2018-2019 due to the improvement of non-oil revenues and the improvement of Zakat collection, and this increase declined in 2020 as a result of the decrease in oil revenues that exceed 50% of revenues

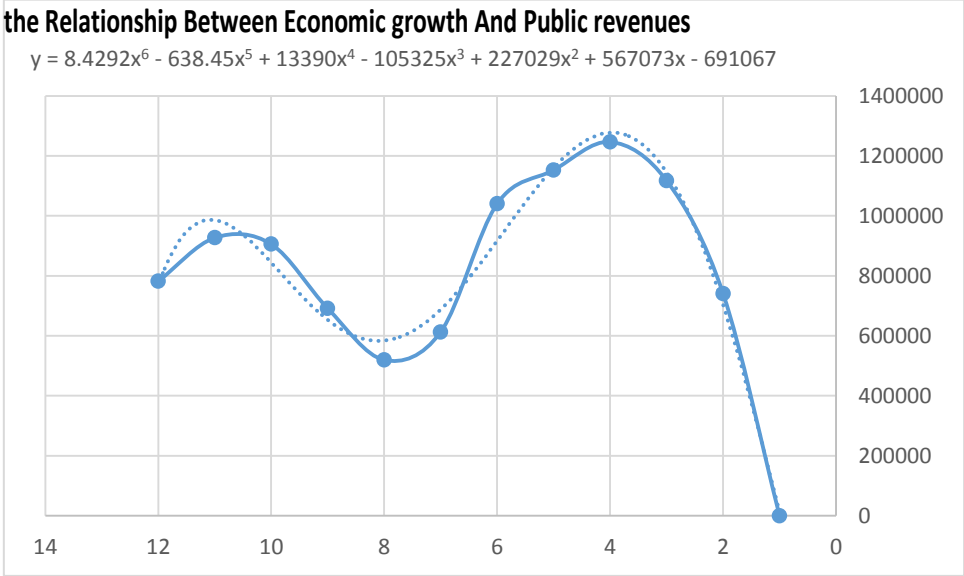


Figure No (2) shows

The Relationship Between Economic growth And Tourism Investments

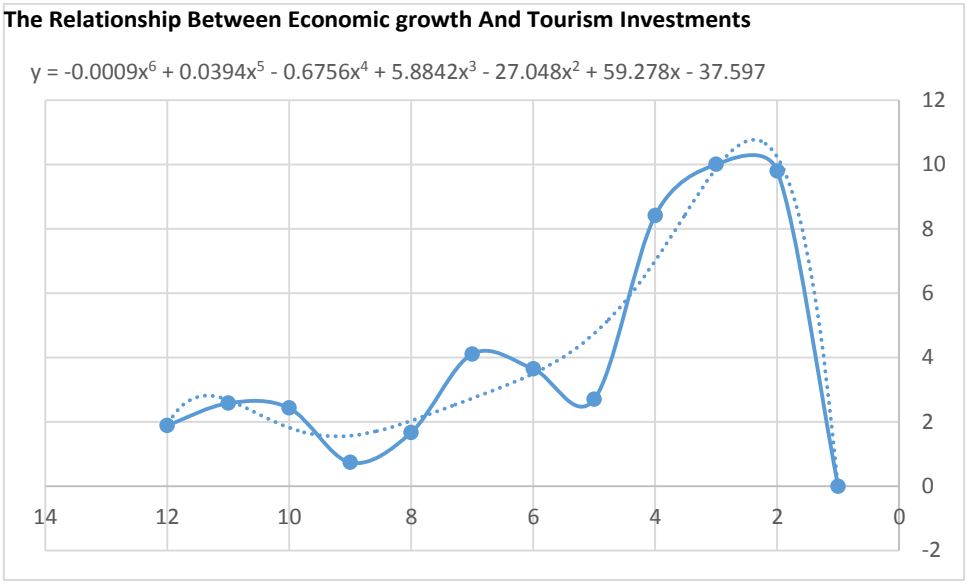
Table No. (3) The Relationship Between Economic growth And Tourism Investments

EXT	GDP	Year
9.8	1980777	2010
10	2517146	2011
8.41	2759906	2012
2.7	2799927	2013
3.65	2836314	2014
4.11	2453512	2015
1.67	2418508	2016
0.74	2582198	2017
2.43	2949457	2018
2.58	2973626	2019
1.89	2637629	2020

Source prepared by the researcher from the main table of the study

Table No. (3) shows that tourism investment decreased in 2013-2017-2020 due to the decline in manpower and human cadres in the air transport and hospitality sectors and many obstacles and government investments alone are not enough for tourism investment, there must be concerted efforts between the two sectors

Figure No (3) shows



Methodology and Data

Type of study

This research followed a quantitative approach to test Measuring the impact of tourism sector variables on economic growth in the Kingdom of Saudi Arabia during the period 2010-2020

Analysis methodology and study model estimation results:

This theme includes the methodology, standard method and results reached through the application of standard methods on the study data to find out the extent to which economic growth is related to the tourism sector in the Kingdom of Saudi Arabia during the period (2010-2020). Or rather, the extent to which the variables of the tourism sector affect the economic growth in the Kingdom of Saudi Arabia, as the axis includes the presentation of the standard methodology used in the analysis through the use of modern standard methods and methods that study the relationships between variables, which are represented in the methods of analyzing integrated time series regression models by studying the unit root of the time series of the study variables to determine the degree of its dormancy (integration) and then estimate the model using the methodology of (GARCH) models, as follows:

First: Description of the study model

The standard model to identify the impact of the tourism sector on economic growth in the Kingdom of Saudi Arabia during the period (2000-2020) includes a number of economic variables that are expressed by a mathematical function that is determined through the literature represented in economic theory and applied studies, and it is the first and basic step carried out by the researcher in economic measurement, to study a specific economic phenomenon, which means expressing the phenomenon in a mathematical formulation in order to reflect the different relationships, and this step includes the following:

Determine the variables of the study:

The study relied on determining the variables of the standard model on the sources of economic theory and the information available for previous standard studies in analyzing the relationship between the variables of the tourism sector and economic growth, and since the study aims to measure the impact of tourism sector variables on economic growth in the Kingdom of Saudi Arabia, so the variables are as follows:

- Dependent variable: Gross domestic product (GDP), which expresses economic growth.
- Independent variables: These are the variables that measure the tourism sector and have been identified by the following variables:

1- Tourism revenues (RVT), which represents the size of income obtained by the Kingdom of Saudi Arabia from various channels of the tourism sector.
2- General revenues (TRV), which represents the size of revenues obtained from all sectors in the Kingdom.
3- The size of tourism investments (EXT), which represents the size of what the Kingdom of Saudi Arabia spent on tourism projects.

The functional formula of the model

$$\boldsymbol{LOG(GDP) = B0 + B1LOG(RVT) + B2LOG(TRV) + B3LOG(EXT) + ui ----(1)}$$

where:

(GDP): Gross Domestic Product (GDP)

(RVT) tourism revenues.

(TRV) Public revenues

.(EXT) Tourism Investments

B0 : Constant in the model.B3,B2,B1 Regression constants.

1. the sign of the constant is expected to be positive (B0), as it represents Gross Domestic Product when all independent variables are equal to zero.
2. The sign for tourism revenues (B1) is expected to be positive because there is a correlation relationship between tourism revenues and economic growth.
3. The Tourism Investments sign (B2) is expected to be positive because there is a correlation relationship between Tourism Investments and economic growth.

Analysis Methodology:

The study relied on (GARCH) models and (GARCH) models are considered modern models in time series analysis and forecasting, as they are very distinguished from other models with self-regression in that other models such as (ARIMA) models require that the variance of the random limit of the time series is fixed according to the assumptions of the normal least squares method, and this may not be available in most data of financial and economic variables such as stock prices, exchange rate and other financial variables,

Therefore, we find that (GARCH) models can give a better explanation of phenomena compared to other models, as (GARCH) models require the instability of the time series variance of the variable under study, and this makes them more confident among specialists in the financial and economic field depending on their accurate interpretation of economic phenomena with volatile variation known as (risk or uncertainty period), and therefore this technique came to model conditional variance behavior (Conditional Heteroskedasticity).

This type of model has led to a major shift in applied econometrics, and this modeling began to develop and become what is known as the (General Arch) model or known as the (Generalizeg ARCH) model, and in general it can be said that (GARCH) models are a statistical method for modeling variance behavior and knowing the estimation error.

That's why the researcher was chosen for this model.

Analysis results of the study model

Study model analysis results

The study relied on (GARCH) models is considered one of the modern models in time series analysis and forecasting, as it is significantly distinguished from other models with self-regression in that other models such as (ARIMA) models require that the variance of the random limit of the time series is constant according to the assumptions of the ordinary least squares method (OLS), and this may not be available in most financial and economic variables data. variables such as stock prices, exchange rate and other financial variables, so we find that models (GARCH)

It can give a better explanation of the phenomena compared to other models, as the (GARCH) models require the heterogeneity of the variance error of the time series of the variable under study, and this makes it more confident among specialists in the financial and economic field depending on its accurate interpretation of economic phenomena with volatile variation, known as ((Period of risk or uncertainty), and therefore this technique came to mix the behavior of (Conditional Heteroskedasticit

This type of model has led to a major shift in applied econometrics, and this modeling has begun to develop and what is known as the Generalizeg ARCH model has become a general . model (GARCH) that can be said to be a statistical method for modeling variance behavior and knowing the error of estimation.

The data was also processed and analyzed using the standard analysis software E.Views12..

Second: Results of estimating the study model:

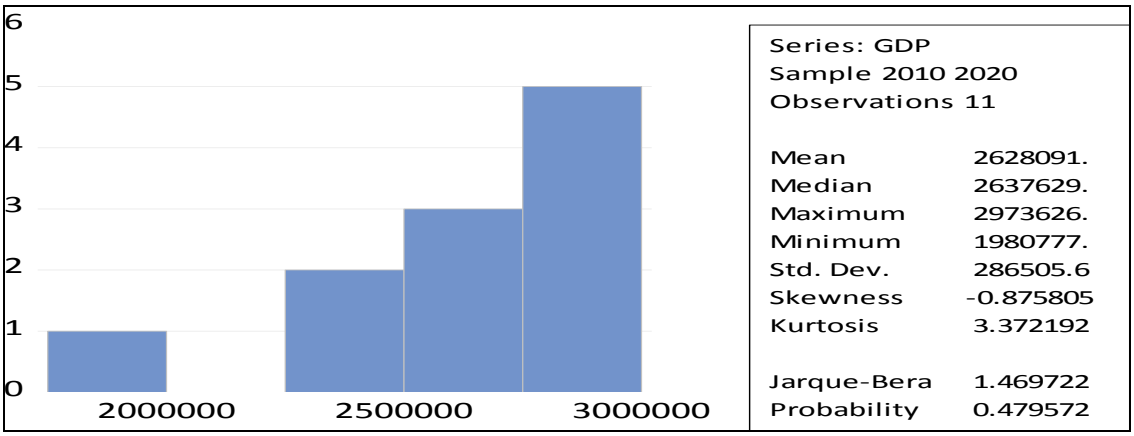
First, the descriptive statistical analysis of the variables to reflect their developments during the period under measurement, then the Root of unity tests (Dickie Fuller Extended to test the characteristic of static study variables Then conduct a Cointegratio test for the study variables addition to the results of estimating the standard model to measure the impact of tourism variables on economic growth in the Kingdom of Saudi Arabia. This is as follows:

1- Descriptive statistical analysis of the study variables: -

The study used descriptive statistical analysis in the first stages of statistical analysis in the analysis of the study data in order to describe and analyze the data of the study variables during the period under measurement, This is done using the mean, standard deviation, and range to know the largest and least value, as well as the use of the torsional modulus to determine the form of distribution of the data.

1. Gross Domestic Product

Table (4) shows the descriptive statistical analysis of the GDP variable

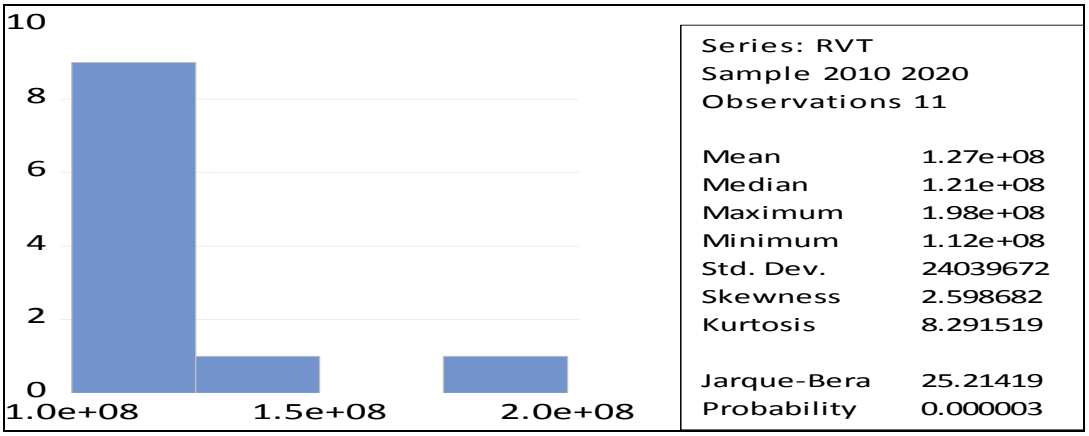


Source: Preparing the researcher from the results of the estimate using the program E.Views12

The average GDP during the study period (2000-2020) was (2628091) million riyals with a standard deviation of (286505.6) and a maximum of (2973626) in (2019) and a minimum of (1980777) in the year (2000), and the torsion test indicates that the data of the GDP variable series are distributed normally, as the value of the torsion coefficient was (-0.875) and supported by the (Jarque-Bera) test, where the test value was (1.46) with a significant significance level (0.479), which is a value greater than the level of significance (0.05).

2. Tourism revenues

Table (5) shows the descriptive statistical analysis of the tourism revenue variable

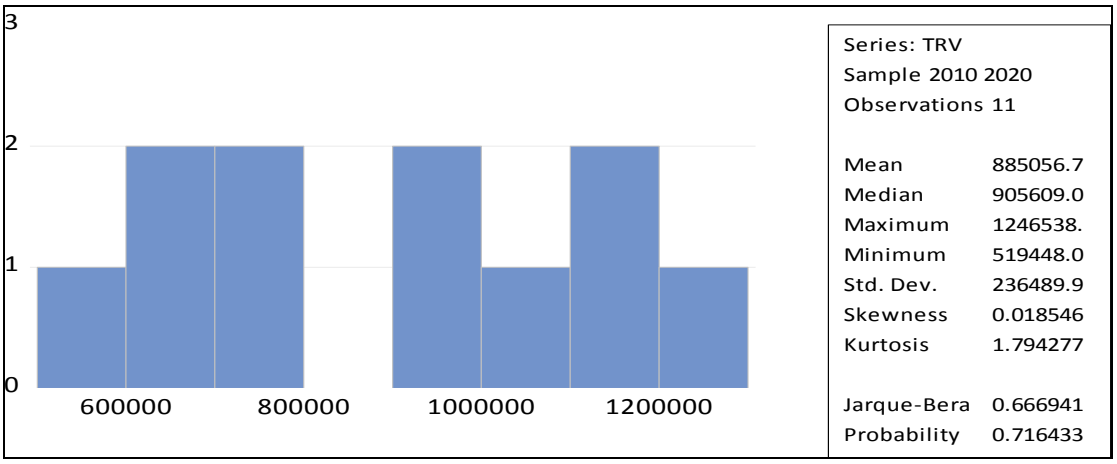


Source: Preparing the researcher from the results of the estimate using the program E.Views12

The average volume of tourism revenues during the study period (2000-2020) was (127115945.5) million riyals with a standard deviation (24039672) and a maximum of (197856000) in (2019) and a minimum of (118725764) in (2017), and the torsion test indicates that the data of the tourism revenue variable series are not distributed normally, as the value of the torsion coefficient was (2.59) and this is supported by the (Jarque-Bera) test, where the test value was (25.21) with a level of significant significance (0.000003), which is a value lower than the level of significance (0.05).

3. Public revenues

Table No(6) shows the descriptive statistical analysis of the public revenue variable

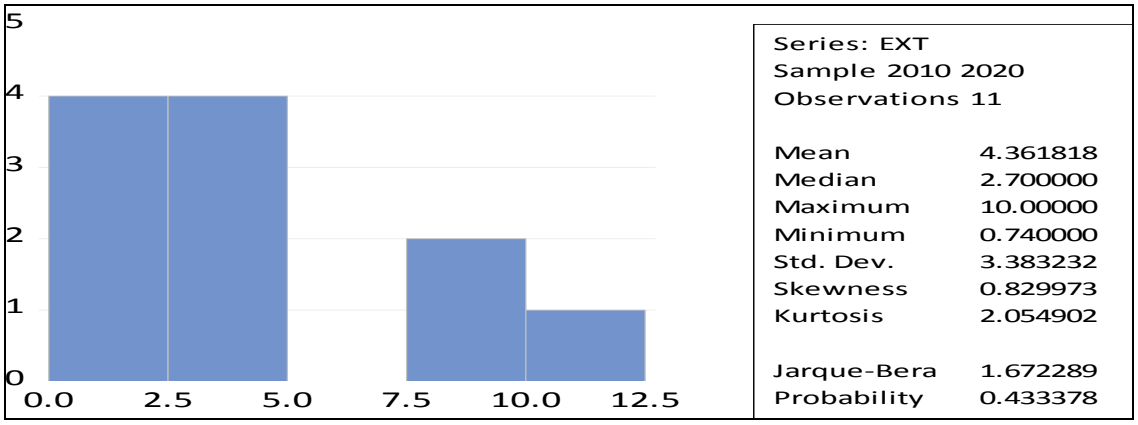


Source: Preparing the researcher from the results of the estimate using the program E.Views12

The average volume of public revenues during the study period (2000-2020) was (885056.7) million riyals with a standard deviation of (236489.9) and a maximum of (1246538) in (2019) and a minimum of (519448) in (2017), and the torsion test indicates that the data of the public revenue variable series are distributed normally, as the value of the torsion coefficient was (0.018) and this is also supported by the (Jarque-Bera) test, where the test value reached (0.6669) with a level of significant significance (0.716), which is a value greater than the level of significance (0.05).

4. Tourism Investments

Table No(7) shows the descriptive statistical analysis of the variable of tourism investments



Source: Preparing the researcher from the results of the estimate using the program E.Views12

The average volume of tourism investments during the study period (2000-2020) was (4.36) billion riyals with a standard deviation of (3.38) and a maximum of (10) billion riyals in (2011) and a minimum of (0.74) billion riyals in (2017), and the torsion test indicates that the data of the tourism investment variable series are distributed normally, as the value of the torsion coefficient was (0.829) and this is also supported by the (Jarque-Bera) test, where the test value was (1.67) with a significant significance level (0.433), which is a value greater than Morale level (0.05).

2- Stability test study variables: -

Stability test study variables: -

The practical application of the (GARCH) methodology requires first "to reveal the stability of the series of variables of the study in order to properties of the time series of all variables in the model during the study period and to ensure the extent of its stability, as the condition of stillness is a basic condition for analyzing time series to reach sound and logical results in order to know the stability of the time series under study and determine the degree of integration of these series because of their utmost importance to reach sound results. In order to avoid the phenomenon of false deviation, which means that the relationship between two variables or a number of economic variables expresses a false relationship, among the most important methods used is the Cockie Fuller Extended Test (ADF) and the Phelps Perron test (PP). This test (Augmented Dickey-(Fuller, 1979) includes three different regression equations, the first containing the fixed the second with the presence of the fixed and the general direction, and the third without a fixed .and a general direction. And the third without a fixed limit and a general direction, and the zero hypothesis H0:B=0 is tested, which means the existence of the unit root or variable is unstable if the calculated absolute value t is smaller than t tabular value , which requires re-testing again but after taking the differences, and the alternative hypothesis H1:B<0, which indicates the stability of the series, if the calculated |T | is greater than the | T | tabular value, and when the original series is found static at the plane, it is said They are integrated from zero degree (0) But if it is required to take the differences (1, 2, ...d) to make it stable, we say that it is integral of degree (d).

Table No (8) Results of Unit Roots Test for Study Variables

First difference		Level		Variables
Test value	P.value	Test value	P.value	
-6.410-	0,0000	-2601	0,1005	Gross Domestic Product (GDP)
4984-	0.0003	0,122	0,963	Tourism Revenue (RVT)
6.325-	0,0000	-1.543-	0,502	General Revenue (TRV)
6.537-	0,0000	-1.597-	0,475	Volume of Tourism Investments(EXT)

Source: Preparing the researcher from the results of the estimate using the program E.Views12

Table No. (8) shows and based on the Dickie Fuller Extended Test (ADF) that all variables are non-stationary in their levels, so unit root tests were re-performed again for these variables, so the results indicated that there is stationary for these variables after the first differences at a significant level of 5%, and this means that the time series of these variables are integrated of the first order.

3- Cointegration test

Check of the stability of the time series of the study variables and their integrated of the same degree which is the first degree I

(1) The existence of a balance relationship between time series over long periods is tested by the joint integration test (Johansen 1988) which is considered a test of the rank of the matrix (r),the following:-

If the rank of the matrix is equal to zero (Rank, r=0), then this matrix is zero, all variables have unit roots, and the variables are not for her. **cointegration**

- if the rank of the matrix is (n = r), then all variables do not have unit roots, they are stable variables.

If the rank of the matrix is equal to one (r=r), then there is one Cointegrationr vector.

A Whether the rank of the matrix (<r < n1) indicates the existence of Multil Cointegration vectors

Table No. (9) shows the cointegration test for the study variables

	0.05	Trace		Hypothesized
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.2630	47.85613	38.93204	0.305769	None
0.2177	29.79707	23.60410	0.254954	At most 1
0.1970	15.49471	11.24313	0.175194	At most 2
0.0758	3.841465	3.153614	0.072336	At most 3
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Prob.**	Critical Value	Statistic	Eigenvalue	No. of CE(s)
0.7219	27.58434	15.32794	0.305769	None
0.5124	21.13162	12.36097	0.254954	At most 1
0.3697	14.26460	8.089513	0.175194	At most 2
0.0758	3.841465	3.153614	0.072336	At most 3

Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

Table (9) shows the results of the Cointegrationr test between the study variables using Johansen Cointegration Test, and it is clear through the results of the effect difference (Trace test) and the maximum Eignvale test between the study variables that there is no common integration at significance level % 5, where we find that all probability values are greater than significance level (0.05), which means that these time series do not rush to long-term equilibrium again after any deviation resulting from a temporary shock, that is, these variables diverge from each other in the long term, and therefore any policy taken to stabilize any of the variables of the study would not help stabilize the levels of other variables in the long term..

Results of estimating the study model.

GARCH models were used to estimate the study models. All calculations were performed using E-views12.

Table No. (10) Results of estimating the model of the impact of tourism on economic growth in the Kingdom of Saudi Arabia

Prob.*	t-Statistic	Std. Error	Coefficient	Variable
0.0000	1.2E+101	4.3E-102	0.506426	LOG(RVT)
0.0000	716.8328	0.000555	0.397654	LOG(TRV)
0.0000	9.561114	0.008174	0.078157	LOG(EXT)
0.0999	1.645415	0.000372	0.000613	C
R-squared=0.624				
Adjusted R-squared= 0.605				

Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

The results of estimating the GARCH model to estimate the relationship between tourism revenues, public revenues and investments in the tourism sector as independent variables and economic growth as a dependent variable shown in Table (10) showed that there is a statistically significant positive relationship between (RVT) and(GDP) where the value of the regression coefficient of the

variable (0.506426) and the level of significant significance (0.0000), which is a value less than the level of significance (0.05), which indicates that the change in the size of tourism revenues by 1% Increases growth Economic by (0.5%)

The results of the estimate indicate that there is a statistically significant positive relationship between public revenues, where the value of the regression coefficient was (0.397654) and the level of significant significance (0.0000), which is a value less than the level of significance (0.05), which indicates that the change in the size of public revenues by 1% to increase economic growth by (0.4%). results indicate that there Positive relationship between statistically significant and investment in tourism and economic growth in the Kingdom of Saudi Arabia, where the value of the regression coefficient for the variable reached (0.078157) and at a level of significance (0.0000), which is a value less than the level of significance (0.05), which indicates that the change in the size Investing in tourism by 1% increases economic growth at a rate of (0.1%). The coefficient of determination, whose value was (0.61), indicates that the Independent variables (tourism revenues, public revenues, investment in tourism) explain (61)% of the variance in the dependent variable (economic growth), while the remaining percentage of these changes is (39%).) can be attributed to other variables not included in the model. This result indicates the good fit of the GARCH model in explaining the impact of tourism sector variables on economic growth in the Kingdom of Saudi Arabia..

check the model

to check that the model meets a number of standard criteria necessary for the process of sound statistical inference. The most important of these criteria are the assumptions regarding the error limits, that the random error are independent of each other and have a uniform distribution, and that they are normally distributed with a mean of zero and variance σ^2 , and μ_t since it is unknown, the Residuals are used instead Below are the to check results

Regression – Residuals Analysis

The following table shows the results of zero hypothesis (H0) that the residuals are not independent of each other using the Autocorrelation test, where the results indicate that there is no statistical evidence to accept the zero hypothesis (H0) there is no Autocorrelation for the remainders, where the P(probare) values at all time were

Table (11) shows the results of (H0)

Prob*	Q-Stat	PAC	AC	
0.761	0.0923	0.044	0.044	1
0.931	0.1438	0.031	0.033	2
0.985	0.1533	0.011	0.014	3
0.994	0.2245	0.036	0.037	4
0.998	0.2549	-0.028	-0.024	5
0.997	1.5038	-0.039	-0.052	9

Source: Prepared by the researcher from the study data based on the outputs of the E.Views12

Results of the test of the hypothesis Heteroskedacit

To check the ARCH Heteroskedacit the following table shows the results of the test, which indicates that there is no statistical evidence to accept the hypothesis of H0, which means that there is no problem of variance difference, as the value of the test was (0.769), which is a value greater than the level of significance (5)%.

Table No. (12) ARCH Heteroskedasticity

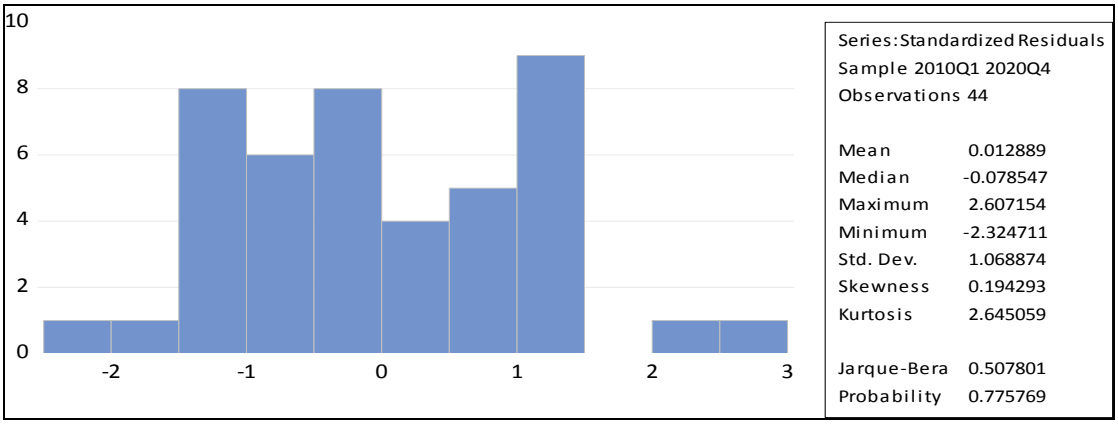
0.776	Prob. F(1. 11)	0.0819	F-statistic
0.769	Prob. Chi-Square(1)	0.0857	Obs*R-squared

Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

To check the condition of normal distribution using the test Jarque-Bera

The value of the Jarque-Bera test (0507) was a p-value of (0.775), which is greater than the significance level of 5%. This value indicates that Residuals follow a normal distribution at the importance level of 5%

Figure No. (13) Normal distribution test for the error term



Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

Test the suitability of the estimated model

TO determine and design the estimated model In terms of the form of the function , the Nyblom test was used, and the results shown in Table (10) showed that the corresponding probability value for all variables coefficients is greater than the level of significance at all levels of significance, which indicates the non-acceptance of the H0 hypothesis, which states the validity of the form of the estimated model..

Table (14) shows the results of the Niblum test

10% Crit.	5% Crit.	1% Crit.	Statistic	Variable
0.353	0.470	0.748	0.076889	LOG(RVT)
0.353	0.470	0.748	0.072840	LOG(TRV)
0.353	0.470	0.748	0.114151	LOG(EXT)

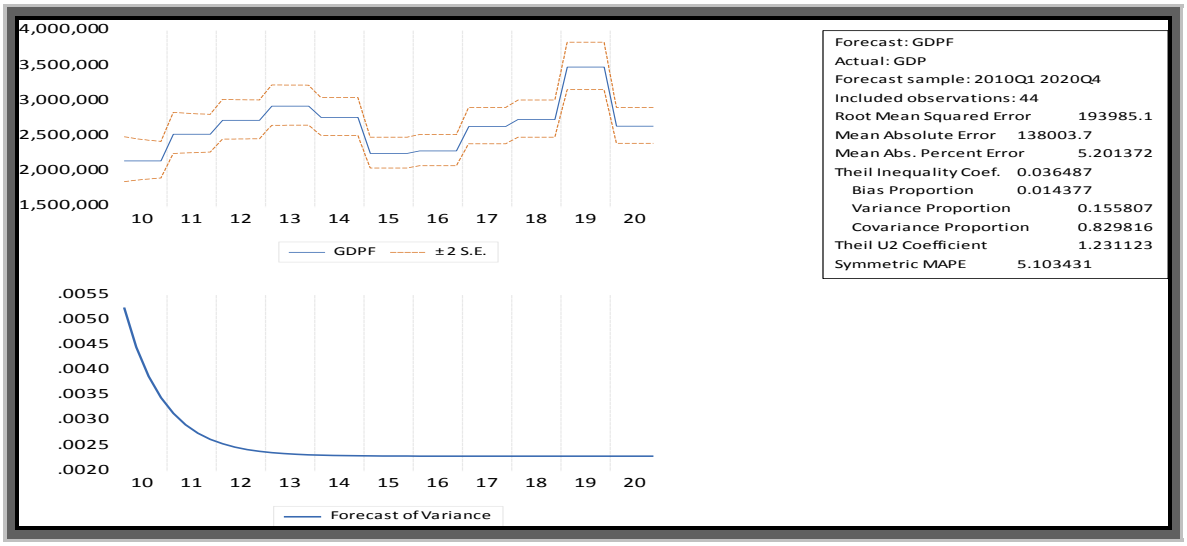
Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

Test the model's ability to predict.

Forecasting is one of the important goals in econometrics, as the course of the phenomenon is positively identified in the future to help in the process of planning, control and decision-making, and forecasting studies the evolution of the phenomenon over time as a factor that shows the outcome of the impact of all factors affecting this phenomenon. Phenomena change with time from month to month and year to year. Time itself is not an influential factor in the development of economic phenomena as an objective indicator independent of human action. However, time is inherent in the development of economic phenomena, and therefore it is possible to link the state of the phenomenon to the moment corresponding to this situation, or between the developments of the phenomenon and the period of time in which those developments have taken place or will take place resulting from factors other than time that affect the phenomenon and lead to its change in quantity and quality.

The predictability of the estimated model can be tested by using the Theil equivalent. It is clear from the results of the estimate shown in Figure (15) where the value of the Thiel coefficient amounted to (0.056), a value approaching zero, and this result indicates that the estimated study model has an excellent ability to predict during the study period and this ability to predict can be observed through Figure (15), Which shows the behavior of the actual and expected values of economic growth in the Kingdom of Saudi Arabia according to the estimated model, and therefore the results of this model can be relied upon for the purposes of analysis, policy evaluation, forecasting and economic decision-making in the tourism sector in the Kingdom of Saudi Arabia.

Table (15) shows the results of the model's ability to predict



Source: Prepared by the researcher from the study data based on the outputs of the E.Views12 program

conclusion and recommendations:

Results:

The study reached the following results:

1. The results of the stability tests for the series of study variables, using the unit root test, showed that all the variables under study (public revenues, Tourism Investment , economic growth ,tourism revenues) are unstable at their levels, as they stabilized at the first difference.
2. Through the co-integration test, the study found that there is a co-integration relationship between public revenues , tourism revenue, Tourism Investment , and economic growth.
3. The study proved the existence of a correlation, statistically significant relationship between public revenues and economic growth in the Kingdom of Saudi Arabia during the study period.
4. The study found a correlation, statistically significant relationship between tourism revenues and economic growth in the Kingdom of Saudi Arabia during the study period.
5. The study found a correlation, statistically significant relationship between general revenues and economic growth in the Kingdom of Saudi Arabia during the study period.
6. The study found a correlation, statistically significant relationship between the volume of investment in the tourism sector and economic growth in the Kingdom of Saudi Arabia during the study period.
7. The study proved the importance of the explanatory ability of tourism sector variables in economic growth, as the value of the coefficient of determination was (61%).
8. The study found that there is a good ability of the estimated model in predicting economic growth through the variables of the tourism sector in the Kingdom of Saudi Arabia

conclusion

This study included an econometric model to identify the impact of the tourism sector on economic growth in the Kingdom of Saudi Arabia during the period (2000-2020) on a number of economic variables expressed by a mathematical function that was determined through the literature represented in economic theory and applied studies

And The study relied on the identification of the variables of the standard model on the sources of economic theory and the information available for previous standard studies in the analysis of the relationship between the variables of the tourism sector and economic growth, and since the study aims measure the impact of the variables of the tourism sector on economic growth in the Kingdom of Saudi Arabia, so the variables are as follows:

- Dependent variable: Gross domestic product (GDP) which expresses economic growth.
- Independent variables: variables that measure the tourism sector

The functional formula of the model subject of measurement was as follows:

LOG(GDP)=BO+B1LOG(RVT)+B2LOG(TRV)+B3LOG(EXT)+ui

Where: (GDP): Gross Domestic Product (GDP)

(RVT):size of tourism revenues.

(TRV): The size of public revenues.

(EXT): size of tourism investments.

B0 : fixed limit in the form. B3,B2,B1 regression coefficients.

ui: Random error limit (residues).

The study reached the following results to solve the problem of the study and prove its hypotheses and they were as follows

- the coefficient of the constant (B0) is positive where the size of GDP is represented when all independent variables are equal to zero.
- the coefficient of the size of tourism revenues (B1) is positive because there is a positive relationship between the size of tourism revenues and economic growth. - the coefficient of the size of public revenues (B2) is positive because there is a positive relationship between the volume of public revenues and economic growth. The signal of the size of tourism investments (B3) is positive because there is a positive relationship between the size of tourism investments and economic growth. This confirms the impact of tourism on the economic growth in the Kingdom of Saudi Arabia during the study period, which was explained in the analysis of the study.

Recommendations:

Based on the previous results, the study recommends the following:

- Analyzing the internal and external tourism environment to identify strengths and weaknesses and to identify opportunities and threats.
- Paying attention to the quality of service provided to tourists, which reflects the civilizational, cultural and humanitarian level of the Kingdom of Saudi Arabia.
- Enhancing cooperation with institutions that support tourism activity, represented in transportation, health, education services, border crossings, and others.
- Paying attention to tourism marketing on a large scale in the Kingdom by providing information to visitors in general and working to ensure the adequacy of guidance and information units in appropriate locations.
- Easing restrictions on the tourism labor market by creating specialized training institutes and distinguishing in the Saudization policy among various economic activities.
- The necessity of creating some kind of interaction and cooperation between the government agencies concerned with the tourism sector and the business sector represented by the chambers of commerce in order to reach a real and realistic solution to the obstacles facing the tourism sector.

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Appendices

Stability test of study variables

		Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
Prob.*	t-Statistic			
0.0000	-6.410379	Augmented Dickey-Fuller test statistic		
	-3.596616		1% level	Test critical values:
	-2.933158		5% level	
	-2.604867		10% level	
	*MacKinnon (1996) one-sided p-values.			

	Null Hypothesis: D(RVT) has a unit root			
		Exogenous: Constant		
Lag Length: 9 (Automatic - based on SIC, maxlag=9)				
Prob.*	t-Statistic			
0.0003	-4.984389	Augmented Dickey-Fuller test statistic		
	-3.646342		1% level	Test critical values:
	-2.954021		5% level	
	-2.615817		10% level	
	*MacKinnon (1996) one-sided p-values.			

	Null Hypothesis: D(TRV) has a unit root			
		Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
Prob.*	t-Statistic			
0.0000	-6.325095	Augmented Dickey-Fuller test statistic		
	-3.596616		1% level	Test critical values:
	-2.933158		5% level	
	-2.604867		10% level	
	*MacKinnon (1996) one-sided p-values.			

	Null Hypothesis: D(EXT) has a unit root			
		Exogenous: Constant		
Lag Length: 0 (Automatic - based on SIC, maxlag=9)				
Prob.*	t-Statistic			
0.0000	-6.537657	Augmented Dickey-Fuller test statistic		
	-3.596616		1% level	Test critical values:
	-2.933158		5% level	
	-2.604867		10% level	
	*MacKinnon (1996) one-sided p-values.			

Estimating the study model

Dependent Variable: LOG(GDP)				
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)				
		Date: 09/06/23 Time: 19:27		
		Sample: 2010Q1 2020Q4		
		Included observations: 44		
Failure to improve likelihood (non-zero gradients) after 24 iterations				
Coefficient covariance computed using outer product of gradients				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(4) + C(5)*RESID(-1)^2 + C(6)*GARCH(-1)				
Prob.	z-Statistic	Std. Error	Coefficient	Variable
0.0000	1.2E+101	4.3E-102	0.506426	LOG(RVT)
0.0000	716.8328	0.000555	0.397654	LOG(TRV)
0.0000	-9.561114	0.008174	-0.078157	LOG(EXT)
		Variance Equation		
0.0999	1.645415	0.000372	0.000613	C
0.0428	2.025174	0.377698	0.764903	RESID(-1)^2
0.8724	-0.160559	0.198362	-0.031849	GARCH(-1)
14.77592	Mean dependent var		0.624076	R-squared
0.111724	S.D. dependent var		0.605738	Adjusted R-squared
-2.993867	Akaike info criterion		0.070152	S.E. of regression
-2.750569	Schwarz criterion		0.201773	Sum squared resid
-2.903641	Hannan-Quinn criter.		71.86508	Log likelihood
			0.555432	Durbin-Watson stat

Study variables data

EXT	TRV	RVT	GDP	Year
9.8	740872	111911988	1980777	2010
10	1117527	111920988	2517146	2011
8.41	1246538	115961969	2759906	2012
2.7	1152612	119135895	2799927	2013
3.65	1040141	121149055	2836314	2014
4.11	612693	124914581	2453512	2015
1.67	519448	127632082	2418508	2016
0.74	691505	118725764	2582198	2017
2.43	905609	124136878	2949457	2018
2.58	926845	197856000	2973626	2019
1.89	781834	124930200	2637629	2020

Source: General Authority for Statistics - Ministry of Investment - General Investment Authority - in the Kingdom of Saudi Arabia - for the years of study