The Economic Diversification Level of Kingdom of Saudi Arabia (KSA) Under Vision of 2030 by Using Normalized Index Hirschman Herfindahl in(1990 – 2020)

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Abstract

The economic diversification strategy is an effective strategy that contributes to economic growth by increasing the contribution of non-oil productive sectors to high growth rates. The study aimed to estimate the Kingdom's economic diversification indicators based on the Hervendal-Hershman factor during the period. (2020-1990) for five variables (GDP - exports - imports - government revenues - total capital formation) By analyzing the impact of diversification on growth in the Saudi economy, diversification is a multidimensional phenomenon using the Hirvendal-Hirshman coefficient to produce a real assessment of the reality of diversification in the Saudi economy during the study and the problem of basic study crystallizes the key question is whether diversification has contributed to increasing economic growth rates in Saudi Arabia? To answer this question, the study followed a methodological and descriptive approach by tracking the trajectory of the Saudi economy and then benchmarking analysis by building a standard model measuring the degree of economic diversification in the Kingdom during the study period, the study found that there is a weak impact of economic diversification as the impact of the Hirvendal-Hershman diversification coefficient on Saudi. (2.33) This is due to the high reliance on the oil sector compared to other sectors of the country where the low levels of diversification were accompanied by the growth of the country's gross domestic product (GDP) which means that the growth in the Saudi economy was not accompanied by a marked diversification of the economic base. Therefore, the study recommended that the efficiency and support of other major economic sectors should be raised from the source of oil revenues.

Key words: economic growth, economic diversification, Gross Domestic Product (GDP) and rentier economy.

introduction

Saudi Arabia's Vision 2030 aims to bring about positive structural changes in Saudi revenues so that there is a balance between oil revenues and non-oil revenues in a way that achieves economic diversification in sources of income and economic growth. The importance of achieving the objective of economic diversification is a reaction to the continued volatility of crude prices, making Saudi oil export earnings volatile in a way that may harm the goals of sustainable growth Which creates a need to provide stable sources of financing. The Kingdom has paid great attention to the development and development of the non-oil export sector, which is reflected in the quality of production and drives increased productivity and thus the growth of non-oil exports. The importance of achieving the objective of economic diversification is a reaction to the steady volatility of crude oil prices, making Saudi oil export earnings volatile in a way that can be driven by sustainable growth goals, which depends heavily on the need to provide stable and unwavering sources of financing from time to time.

First: the problem of a study

The problem with the study is that Saudi Arabia's economy is an oil economy and because of the sharp fluctuations in oil prices. This has resulted in the country's pattern of development being linked to the volume of oil revenues. The state's fiscal policy has also been linked to the volume of oil revenues, which has made the Saudi economy highly sensitive to fluctuations in the global market as a result of fluctuations in oil prices. The Kingdom of Saudi Arabia sought to increase non-oil exports by providing financing and facilities, as well as human resources development, to secure competitive benefits that would help the Kingdom to increase its share of non-oil exports. Based on the above, the problem of the basic study is materializing in the following question: Has diversification contributed to Saudi Arabia's economic growth?

Second: the importance of the study

The importance of the study comes from the importance of the topic I have addressed, as economic diversification is one of the important topics that occupies a great place in the economies of the quadrilateral States and which has been emphasized by a series of economic studies as a way out of economic unilateralism and an essential way to achieve economic stability and stand in the face of shocks on the external and internal routes and to prevent them from disrupting the process of sustainable economic development.

Third: Objectives of the study

The study's main objective, which it seeks to achieve, is to estimate the indicators of economic diversification based on the Hirvendal-Hirschmann coefficient for the period 1990-2020 for five variables: real GDP, exports, imports, government revenues, gross fixed capital formation and then to analyze the impact of such diversification on growth in the Saudi economy.

Fourth: The hypotheses of the study

The study imposed the fundamental premise that there is a positive impact of diversification on Saudi Arabia's economic growth.

Fifth: Study Methodology

The study followed the curriculum and description by tracking the course of the Saudi economy and benchmarking analysis where a standard model measuring the degree of economic diversification in the Kingdom will be built during the study period covered (2020-1990) GDP - exports - imports - revenues) of indicators using (government fixed money Eviews - gross Hervendal-Hershman coefficient composition and using a program.

Sixth: Previous studies

The aim of the economic diversification process is to diversify the production structure and create new income-generating sectors so that overall dependence on key revenues in the economy is reduced as in the case of oil countries. International experience has confirmed that this process will lead to higher rates of economic growth in the long term. However, its impact varies among the world's countries in accordance with domestic and external economic conditions and growth strategies in these countries.

- **study** (Bouflaem and Jamal, 2022) which examined the relationship between economic diversification and economic growth in Algeria during the period (1990-2020) The study found that there was a causal link between oil prices and the Hirvendal-Hirschmann index and that diversification in Algeria did not yield the desired result despite ongoing efforts to study.
- **study** (Noura, 2022) .The study aimed to test the long-gel relationship between human capital development and Saudi Arabia's non-oil exports during the period of (1981-2014) The study hypothesized a correlation between Saudi Arabia's increased non-oil exports, human capital and global income. The study used Autoregressive model for lags (ARDL) The study found a long-term relationship between variables, which explains the existence of this relationship as global income, which is linked to an expulsive relationship with non-oil exports and inflation. Reverse with non-oil exports Study.
- **study** (Bashir, 2021) on the Role and Importance of Economic Diversification In Iraq Conditions and Measurement Mechanisms Quantitative Study for the Years (2003 - 2019) The study aimed to test the long-term relationship between human capital development and Saudi Arabia's non-oil exports during the period of (1981-2014) The study found that there was a significant decline in indicators of economic diversification and ineffectiveness of the development programmes implemented In Iraq for the years under consideration, the index's impact on stimulating economic growth has not exceeded because of the low performance of the Iraqi economy, which suffered from an imbalance in its structure.

- **study** (Saud & Shafan Study, 2021) on economic diversification in Iraq during the period (1980-2017) and impact of key economic sectors (Agriculture Manufacturing - Tourism - Oil) On GDP as an indicator of economic growth, the study found that Iraq's economy continues to suffer from structural imbalances due to excessive dependence on oil revenues, as the contribution of non-oil economic sectors is very little compared to that of the extractive sector.
- **study** (Adel and Mehdi Study, 2020) that examined the most important factors determining economic diversity and its impact on GDP using common integration equations .The research aims to study the determinants of economic diversification and its impact on Saudi GDP during the period (1970-2018) In achieving its objectives, the study relied on the Hirvendel-Hirschmann coefficient and joint integration equivalents. The study found that the ratio of oil production to GDP is the variable with a significant effect composite economic diversification.
- **study** (Hujeira and Meziane Study, 2019) A study on economic diversification in Algeria, which examined the reality, prospects and determinants of Algeria's economic diversification through a detailed explanation of the composition of exports outside the burning sector. It also examined the possibility of matching the reality of the Algerian economy to the symptoms of the Dutch illness and highlighting the main determinants of economic diversification during the period(2014-1989). The study found that the reality of Algeria's economy did not correspond to the symptoms of the Dutch bug because of the lack of improvement in the real exchange rate during the period of the study, as well as the absence of a fully operational hypothesis, as well as the weakness of the industry sector, which has weak competitiveness from the outset.
- **study** (Mohammed's study, 2016) on economic diversification in Algeria during the period (1980-2014) The study aimed to demonstrate the ability of the Algerian economy to achieve higher degrees of economic diversification in the future. The study imposed that the oil sector remained one of the main components of GDP. The study therefore found poor diversification in the Algerian economy while continuing to rely almost entirely on the oil sector, which focused on Nigeria's economic diversification during the period. (2011-1980) The number of employment and the proportion of oil exports to total exports, foreign non-oil investment, exchange rate, inflation rate and trade openness were used as determinants for the diversification of GDP based on normal micro-squares. The study found that the impact of all inflation, exchange rate and trade openness was minimal and that the impact of all employment, oil exports and foreign investment was positive in the short and long term.
- **Study (Mamdouh, 2015)** on the topic of the study on economic diversification - its impact on the growth of the Saudi economy during the period (1970-2011) The study aimed to estimate diversification indicators based on Hervendale Hirschmann's coefficient of five variables (Real GDP - import exports - government revenues - gross fixed capital formation - estimated composite diversification coefficient) The benchmark results showed that there is a correlation between the diversification

index and economic growth that the value of the diversification index is increasing (Low degree of economic diversification) may correspond to GDP growth which means that growth in the Saudi economy has not been accompanied by significant diversification in the economic base.

- **study (Mamdouh, 2015)** on the topic of the study examined the impact of diversification-economic on growth in the Saudi non-oil sector during the period 2008-1970. Economic diversification was assessed through the Genetic Index and the Hirvendal-Hirshman coefficient. The standard results showed the adverse impact of diversification on the Kingdom's economic growth and its positive impact on growth in the non-oil sector.

Seventh: Research Gap

This topic was not tested coincidentally, but was the result of several objective and subjective reasons, namely the desire to know the extent to which economic diversification affects economic growth rates in the Kingdom of Saudi Arabia and the sources of such diversification, as well as an attempt to enrich such important topics and link them to Vision 2030.

1/The theoretical basis for economic diversification and its relationship to economic growth

to assess the general state of the Saudi economy and analyze the realities of the non-oil sector and what has been achieved through the course of achieving the objective of economic diversification. Before that, know the theoretical basis of the concept of economic diversification and then identify the most important indicators of its measurement.

1,1 /Concept of economic diversification

Economic diversification has many different concepts according to vision, as it is linked to policies aimed at reducing dependence on a specific number of exporting goods whose price and size fluctuate from time to time, where diversification is defined as "Reducing dependence on the sole resource, moving to a stronger industrial and agricultural base and creating a productive base, which means building a sound national economy oriented towards self-sufficiency in more than one sector" Diversification is seen as "the situation in which all sectors of the national economy contribute closely to the composition of output and the national economy is able to export various goods". Others consider that " Diversify the economy so that "investment is distributed to different sectors of the economy in order to reduce the risk of overdependence investment in one resource from between economic diversification " The situation in which all sectors are activated to contribute to the formation of output and to the building of a stable and balanced economy based on a broad and diverse base of economic resources and characterized by a high degree of internal integration in terms of interdependence of its various sectors and activities, the strengthening of the economy's competitiveness, the diversification of internal and export markets and the balance between the public and private sectors.

1,2 /Justification for economic diversification

There are a range of reasons for the introduction of economic diversification.
a. Moving away from risk: The primary objective of economic diversification is to move away from the risks of a unilateral economy that relies on the composition of its output on one or two sectors, finances its revenues from only one or two sources and relies on the export of only one or two commodities, making it more vulnerable to internal and external shocks.

b. In a unilateral economy, the public sector is fully dependent on the public sector and the private sector is weakened, while in the case of economic diversification there is a balance through which the stimulus of the private and public sector and the creation of competitiveness between the two sectors is provided.

c. The need for economic diversification in order to create an increase in the accumulation of human capital, higher productivity rates and, in the case of unilateral economies, weak accumulation of human capital and deterioration in productivity rates.

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1.3/Economic diversification mechanisms

The mechanisms for success of economic diversification vary from economy to economy depending on the level of economic and social progress as well as the nature of domestic and global economic conditions and transformations. Therefore, the adoption of some of these strategies is the result of their effectiveness and efficiency in achieving economic growth and development through the success of the economic diversification strategy. These strategies consist of the following points:
The need to expand the volume of FDI is one of the most important mechanisms of economic diversification. The success of this strategy depends on the flow of foreign investment, which requires improving the country's public investment climate, reviewing external regulations and legislation and strengthening in force Economic reform programmes in the monetary, financial and trade sector - The market mechanism from the privatization process, which is a key driver in driving economic diversification so as to increase the contribution of economic sectors to GDP generation through trade liberalization and exchange rates, thereby raising foreign exchange earnings and thus increasing state revenues, which is a good indicator of the success of the export diversification process and which is a major part of economic diversification Maximizing public-private interdependence in various areas and activities leading to the integration of the technical and institutional economic component Operationalizing the State's development role, which takes the form of strategic guidance in guiding ongoing development processes and bringing about significant changes in the economic structure and sectoral composition of the economy.

1.4/Diversification Relationship to Economic Growth

Several studies have attempted to demonstrate the nature of the relationship between economic diversification and growth rates in different economies. A number of economic theories and intellectual trends have touched on the interpretation of these legions. Two intellectual trends explain the relationship between diversification and economic growth. The first is the theory of Ricardo's comparative advantages. (1817) which you see in specialization and which is a low degree of economic diversification is a catalyst and source of economic growth as well as Smith, Morgan and Cateskas (1997) Dogon Daji and Mukhtar (2012) emphasize specialization and comparative advantage as an indicator that countries can achieve economic development by specializing in the production of goods that they have a comparative advantage in their production not only for consumption, but also for exporting surplus production and for importing goods that they do not have a comparative advantage in their production second in numerous studies showing that low degree of economic diversification.

1.5/Indicators for measuring economic diversity

There are many indicators used to guide countries that aim to diversify the production base, as shown in the following table**:**

Table No. (1) Indicators of economic recognition

Its effectiveness	indicator
This indicator is important because economic diversification implies the private sector's contribution to economic activity and the higher the private sector's contribution to fixed capital formation, the higher the degree of diversification.	Composition of fixed capital by changing the relative contribution of the public and private sector to GDP
This indicator is one of the indicators for measuring economic diversification, as it depends on the non-centralization of any measure of the degree of contribution of different economic sectors to the absorption of labour.	The development of total employment as a whole sectoral
This indicator reflects the steady rise in non-oil exports on increasing economic diversification	Proportion of non-oil exports to total exports
This indicator indicates the successful development of new sources of non-oil revenues	Evolution of the non-oil revenue base as a proportion of the Government's total revenue

Economic diversification should limit the instability of GDP over time	The degree of unstable output should limit gross domestic diversification and its relationship to economic instability in the oil price
This indicator measures the non-oil sector's contribution to GDP compared to the oil sector's contribution to GDP.	Contribution of various non-oil productive sectors to the composition of GDP vis-à-vis the oil sector

2/Measuring the impact of economic diversification on Saudi economic growth during the period (1990-2020)

This paragraph will be divided as follows:

2,1/The nature of Saudi Arabia's economy and the contribution of economic sectors to GDP

The programs of the Saudi economic reform campaign were launched in 2016 and spurred by Prince Mohammed bin Salman's assumption of the Covenant and then the Kingdom of Saudi Arabia's Vision 2030 at a time when the challenges facing the local economy put him at a crossroads either under the oil price collapse of 2015, which coincided with the rising volume of public expenditures in the absence of other means to support the public finances and thus enter a long recession .Thus entering a long recession that may last for two decades or working on a real and urgent transformation plan for the timely diversification of the Saudi economy, Saudi leadership under the supervision and follow-up of the Crown Prince took the decision to shift towards economic diversification and the development of the non-oil sector to contribute its essential role to economic growth and business sustainability.

Moreover, the growth rates of the non-oil economy at that time did not exceed 0.2 percent until 2016 on the other hand, in that global experiences indicated that there was little hope that the non-oil economy would grow quickly in light of the dependence on oil, all the structures of work, production and public finances. And the mechanisms of general distribution of income until calculating the deficit and the methods and tools of its financing were all dependent on oil, but even the private sector was waiting for its share. Therefore, the talk outside this system is the subject of a huge transformation and a complete restructuring of the economy, its legislation and ways of thinking about it, but what was a challenge at that time has become a reality In a short time and an exciting experience, as the growth of the oil economy reached about 3.3 percent in 2019 and continued its strong growth until it reached 5.4 percent during the first half of 2021. How did this happen during this very short period of time in the life of comparable and similar economic reforms, as the Saudi experience will remain the subject of study and global attention, as there are many countries in the world facing the same conditions that the Kingdom met in 2015 AD and the problem of relying on a single source of income, as the policy at the time relied on Several pillars enabled the Saudi economy to overcome its basic challenges and even the repercussions caused by the Corona pandemic. Modern methods of public financial management and spending control trends are the most important of these pillars, support for private sector business and enhance confidence in

the government and partnership with it, which encouraged more investments and thus affected growth rates in a way Positive as well as the development witnessed by the financial market, debt market and institutional finance The number of companies and funds listed in the financial market increased from 198 companies by the end of 2017 to more than 213 companies currently with a growth rate of more than 7.6%. Foreign investors' ownership in the Saudi stock market rose from 195.9% to less than 70 billion riyals 2017, exceeding the 208 billion mark by the end of 2020 This wide area of financing options for companies and the private sector enabled them to access cash in a safe and sustainable manner at a low cost. The development of financial technology as part of the financial sector development system was an important factor that had a direct impact on improving the efficiency and speed of financial services, which boosted the growth of electronic operations 36% compared to By 2019 AD, in addition to the great efforts in achieving financial inclusion, therefore, it can be said that the Saudi economy witnessed during its modern era a growth in the level of a large number of sectors, using natural resources and its geographical and cultural position among the three continents of the world. This growth resulted in building a solid economic base It has become one of the top 20 global economies and an active member of the G20 and one of the major players in the global economy and oil markets supported by a strong financial system, an effective banking sector and giant government companies based on highly qualified Saudi cadres. Over the past years, the Kingdom has undergone structural reforms on the economic and financial side, enhancing economic growth while maintaining financial stability and sustainability. This is evident in the improvement of the business environment in the Kingdom and the ongoing endeavour to enable the private sector to support economic diversification by improving the business environment and pampering constraints to make it more attractive as well as investing in the previously untapped sectors as well as improving the investment environment and increasing its attractiveness to domestic and foreign investors and to develop and diversify the economy and relieve oil dependence as the diversity of the non-oil sector including exports at the core of Saudi Vision 2030.

The Kingdom of Saudi Arabia has therefore launched a number of economic and financial reforms aimed at transforming the Saudi economy's structure into a diversified and sustainable economy based on enhancing productivity, raising the private sector's contribution and enabling the third sector. Since the launch of the vision, it has also succeeded in implementing many supportive initiatives and structural reforms to enable economic transformation. This transformation has included several major sector-centered efforts, including the promotion of local content and national industries, the launching and development of promising economic sectors. These structural transformations have steadily enhanced the capacity of the Kingdom's economy to overcome the COVID-19 pandemic in 2020. The pace of this structural transformation towards sustainable economic growth is expected to continue in the coming years, especially with a number of giant investment initiatives under the umbrella of the Public Investment Fund and leading companies. It is also expected that the localization of innovative knowledge and techniques will accelerate.

2,2/Justification for Saudi Arabia's Economic Diversity Policy

There are several reasons why the Kingdom must adopt an economic diversity policy, including:

Describing oil as a natural resource is depleted and therefore cannot be risked - Relying entirely on it, but relying on other alternative economic sources to achieve balanced development, oil extraction is seen as a form of depletion of fixed capital stock, leading to volatile oil export earnings, unstable oil prices and fluctuating global demand, affecting the level and growth of GDP, fluctuations in national income levels resulting from fluctuating oil revenues, thus volatility investment rates.

3/Indicators of economic diversification in the Saudi economy

Economic diversity is measured by several statistical indicators that differ in their efficiency and suitability for measurement purposes. Some of these indicators depend on the measurement of dispersion, some on the measurement of concentration, some on the concept of diversity, such as the Hirvendal-Hirschmann factor, the most common of which gives convergent measures in their trends and changes when quantifying economic diversification.

The following is a brief explanation of the Hirvendal-Hirschmann coefficient's mechanism of action, based on measuring the composition, structure and diversity of the variable and used to measure diversification in a phenomenon and highlighting structural changes in its components, where it is widely applied to measure economic diversity and is designed as a basis for measuring the concentration in industry or in a particular sector and the value of the H@@HirVendal-Hirshman pen coin (1≥ h = 0). (10.000 H = 0) Zero and one between zero there is a complete diversity in the economy that is equal to the quotas of activities after their attribution to the overall output of all activities.

If one is true, the amount of diversity is non-existent, a situation where production is based on an economic activity while the rest of the activities do not contribute any share of GDP. The high values of the Hirvendal coefficient are evidence of the economy's weak distribution of its activities equally among a large number of sectors or products and are therefore limited to a few of them.

A-Diversification of GDP

The analysis of the diversification of gross domestic product (GDP) is also based on its distribution to 11 sectorsC, Table 2 summarizes the main sectors and their various productive contributions and the changes between (1990_2020).

Table No. (2) Real GDP Contribution Average Sector Hervendal Factor

Hirfindahl coefficient	average	2020	1990	Sector
4	2.0	2.6	2.8	Agriculture - Forests – Fish
7.8	2.4	1.1-	26.5	Mining and quarrying
5.3	2.3	1.2-	26.6	Crude oil and natural gas
33.6	5.8	6.2	0.0	Other mining and fossil activities
21.2	4.6	11.6	8.4	Manufacturing
6.3	2.5	16.6	15.1	oil refining
41.0	6.4	9.5	1.6-	Manufacturing except oil refining
13.0	3.6	1.3	0.9-	construction and building
7.3	2.7	5.6	0.1-	Transportation, storage and communication
23.0	8.4	6.1	1.3	Financial, Insurance and Business Services
12.3	3.5	5.6	3.1- 3.1	real estate activities

Table No. (2 + 3) shows the proportion of the main sectors' contribution to the Saudi economy in the composition of GDP, as the Saudi economy was a general rational economy (1990) High rates of contribution of mining, quarrying, crude oil, natural gas and oil refining, respectively, as the highest contribution to GDP, with other sectors neglected, but general changes are observed (2020) In the production structure of the Saudi economy, the contributions of the oil sectors have diminished and the contributions of other sectors have increased to varying degrees. The results of Herfendal-Hershman's estimate of the components of the output are highlighted by a marked diversification of GDP, i.e. a particular sector is not focused on the rest of the sectors.

Table No. (3) Hervendal-Hirschmann's GDP factor

Average	2020	2010	2000	1990	Sector
4.0509	0.006721	0.11839	0.16814	0.18174	GDP

B. Diversification of exports

takes export diversification very important in oil economies. To the extent that diversification of exports is important, diversification of exports is whatever the economy can diversify its competitive activities in international trade. Diversification of productive activities without the possibility of diversifying exports indicates the economy's adaptation to its activities.

Productivity to meet domestic needs without international competitiveness therefore highlights the importance of export diversification coupled with diversification of productive activities.

Table No. (4) Hervendal-Hirschmann's for oil and Non-Oil Exports

2020	2010	2000	1990	Sector
0.001708	0.000343	0.31133	0.66618	oil exports
0.151	0.9363	0.94191	0.95372	non-oil exports

Table No. (4) indicates that the Saudi economy is an economy as mentioned above. Consequently, oil exports account for a significant share of total Saudi exports and are significantly affected by price volatility in the world oil markets. Over the past five decades, global oil markets have undergone significant changes and geopolitical events, natural disasters and global economic volatility have severely affected oil prices and thus Saudi oil exports. (1990) was around 0.95372 and continued to decline to 2020, with around 0.151 values approaching zero, indicating that there is a diversity in exports of goods and services after comparing them to Hirvendal's core value Diversification of imports is an important aspect of economic diversification, The national economy imports goods and services from the outside world that it does not produce competitively. Thus, the evolution of import structure represents a change in the national economy's productive structure compared to its needs in the light of production costs compared with import prices.

C. Diversification of imports

Diversification of imports is an important aspect of economic diversification. The national economy imports goods and services from the outside world that it does not produce competitively. Thus, the evolution of import structure represents a change in the national economy's productive structure compared to its needs in the light of production costs compared with import prices

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Table No. (5) Hervendal-Hirschmann's Coefficient to Import

Average	2020	2010	2000	1990	Sector
70.1061	0.128	0.13934	0.11188	0.08433	Imports

Table No.(5) shows an increase in the volume of imports in Western Saudi Arabia by an average of about (70,1061). Hirvendal-Hirshman rates have been close to zero since 1990, reaching around (0.08,433) and (2020) around (0.151), indicating that there is a diversity of imports of goods and services compared to the value of Hirvendal's base coefficient.

D. Diversification of government revenues

Government revenues play an important role in diversifying the economic base in the Kingdom, where government revenues depend heavily on oil revenues. Therefore, diversification must be accompanied by an increase in the proportion of the Government's non-oil revenues to its total revenues.

Table No. (6) Hervendal-Hirschmann's Government Revenue Factor

Average	2020	2010	2000	1990	Sector
34.44	17.69534	38.95747	41.13958	47.13298	oil revenues
5.72	7.302104	0.68895	0.48079	0.34771	Non-oil revenues

Table No. (6) shows the dominance of oil revenues over non-oil revenues at an average of about (34.44) for oil revenues and approximately (5.72) for non-oil revenues and Hervendal Hershmann's non-oil revenue rates in the year (1990) was around 0.34,771 and continued to decline to a year (2020) is about 7.302104, which is close to zero, indicating that there is a diversity in non-oil government revenues after comparing them with the value of the Hirvendal Hershman Core Coefficient, that is, non-oil revenue shares are distributed after proportion to total output across all sectors.

E. Diversification in total fixed capital formation

Total fixed capital formation is an important variable that highlights one of the most important manifestations of the development of economic diversification because it highlights the trends and evolution of investment.

Table No. (7) Hervendal-Hirschmann's total capital formation factor

average	2020	2010	2000	1990	Sector
5.322002	0.01026	0.08119	0.04579	0.28327	Total composition of the capital

3.1/Standard Model Characterization

Standard models represent the picture that reflects the nature of economic relationships and associations that explain the attractions and contrasts in those relationships and the extent to which internal and external variables on the one hand interact with the adopted variable and autonomous variables on the other. Therefore, the process of building the standard model is an essential step in the characterization process in order to name model variables and determine the nature and trends of impact that the index (H.H.)
The average of five diversified indicators, the gross measure of diversification, includes gross domestic product (GDP), exports, imports, revenues and gross composition (GDP). In order to determine the effectiveness of the diversification indicators above, it is essential that (Capital identification and analysis of the nature of its economic impacts. As many studies have shown, the effectiveness of economic diversification is the impact of the economic diversification index on economic growth. Thus, the study's standard model is the following:

$$\underline{Rate=a+B+H.H+u}$$

Where: The model's variable represents the absolute value of growth rates for the Saudi economy/Rate during the period 1990-2020.

Constant and reflects the state of economic growth in the absence or exclusion of the impact of the index.

a. economic diversification
Rate= Function tendency and measure the standard impact of the Economic.
a =Economic Diversification Index (VPI).
B= (independent variable) on the model's.
H.H= independent variable growth and represents the Hervendale-Hirschmann aggregate index for economic diversification.
u =The random variable of the standard model, which represents the effect of model factors on UV growth and other variables that are not included in the economy.

3.2/ Estimation and analysis of the study model
The standard model was estimated based on the following method of:
- regular mini-squares -OLS.
- Use of e-software -Eviews.

The written version was the most representative of the assessment results as presented in the estimated form below.

A - Unit Root Test Results Unit root test results
are an important and fundamental test of time chain variables and in order to ensure realistic results time series variables must pass this test and ensure stability of time chains for each variable individually before estimating the required model... The following tables show the results of this test (Phillips-Perron test for economic growth variant 8) test results.
Null Hypothesis: RATE has a unit root

Exogenous: Constant

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.90661	0.0208
Test critical values:	-2.26397	-2.963972	

Phillips-Perron test table for economic diversification variant No. (9) test results

Null Hypothesis: HH_02 has a unit root
Exogenous: Constant

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.202423	0.0002
Test critical values:	5% level	-2.963972	

Through results based on previous tables (8 + 9) and by comparing Phelps Perron values calculated with Phelps table values, all template variable time series are stable at the level.

B-The results of the Johansson Joint Integration Test

are based on the economic concept of the statistical characteristics of time series, The Joint Integration Model states that economic variables assumed by economic theory indicate a long-term balance between them. Consequently.

Table No. (10) results of the Johansen Joint Integration Test

Date: 07/23/22 Time: 21:12
Sample (adjusted): 1992 2020
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: RATE HH_02
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.326364	17.77037	15.49471	0.0223
At most 1 *	0.195638	6.313469	3.841466	0.0120

Based on the results of Table No. (10) there are several hypotheses about the number of vectors of joint integration of growth function variables, where they emphasize the existence of two vectors of joint integration and thus the existence of a long-term balance between these variables, so that the model becomes a joint integration characteristic, static and non-fake.

C- Evaluation of the results of the study model

After knowing the results of the unit root test and the joint OLS and using a model the results of the economic growth function estimate were reached as shown in the following table:

$$\log(Rate) = C(1) + C(2) * \log(HH) + U$$

Table No. (11) Results of the economic growth function (OLS) using a model

Dependent Variable: LOG(RATE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(RATE(-1))	0.718241	0.134777	5.329123	0.0000
LOG(HH_02(-1))	0.011214	0.007768	1.443613	0.1600
C	2.333203	1.097578	2.125774	0.0432

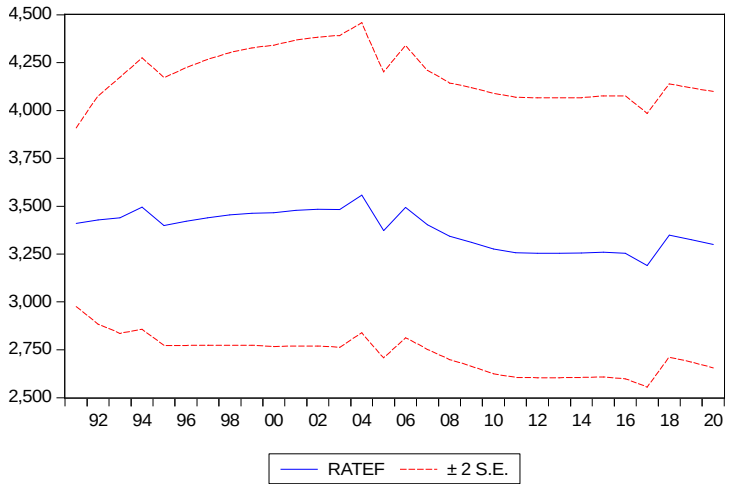
R-squared	0.546429	Mean dependent var	8.115040
Adjusted R-squared	0.494094	S.D. dependent var	0.092820
F-statistic	10.44097	Durbin-Watson stat	1.519920
Prob(F-statistic)	0.000109		

The results of the standard estimate in table no. (11) show the parameters' morale of the dependent and conclusive variable(T, F) respectively and the morale of the economic diversification parameter which means that it is not according to tests Although the increase in the country's degree of diversification has been accompanied by steady growth in GDP in the non-oil sector, although the Saudi economy has been able to increase the degree of economic diversification, some indicators still reflect continued reliance on oil, including the high proportion of oil revenues from actual government revenues and the high proportion of oil exports. (D-W) Located in the measurement acceptance area because statistical value, which means no self-correlation problem C1 has reached a rate of 2.33. The impact of the Hirvendal-Hershman constant on Saudi economic growth has been only such that it is due to the heavy reliance on the oil sector compared to other sectors in the country. The low levels of diversification have been accompanied by the growth of the country's GDP, which means that the growth in the Saudi economy has not been accompanied by a significant diversification of the economic base while the function has been valued. (C2) The weak diversification of the Kingdom's economic growth. These results indicate that the low degree of diversification has a positive impact on economic growth in the sense that the high degree of diversification has not been accompanied by the increasing rate of economic growth, i.e. the Kingdom's efforts have not led to a higher degree of diversification and stimulation of economic growth. As per test.

D. Theil test

We adopted Theil to test the predictability of the economic growth function as in the variance shown in the following figure:

shapes No. (1) The ability of the model's function to predict using Thalys inequality



Forecast: RATEF	
Actual: RATE	
Forecast sample: 1990 2020	
Adjusted sample: 1991 2020	
Included observations: 30	
Root Mean Squared Error	295.7739
Mean Absolute Error	252.6890
Mean Abs. Percent Error	7.857356
Theil Inequality Coefficient	0.043823
Bias Proportion	0.004116
Variance Proportion	0.452167
Covariance Proportion	0.543717
Theil U2 Coefficient	1.410861
Symmetric MAPE	7.664027

Figure no. (12) shows that Thailand's variable value (0.0438) for the economic growth function is close to zero. This indicates the high predictability of conclusions through.

Conclusions

Through what was presented in this study and using the estimated model, standard indicators and analysis of the results, the study reached the following conclusions;

1- The results of the Hervendale coefficient estimate showed the poor degree of diversification and its contribution to achieving economic growth, according to the weak degree of diversification of its different dimensions in the Saudi economy and its continued dependence on oil, because important economic activities remain focused on the oil sector.

2- There is a correlation between diversification coefficient and growth rate which indicates that economic growth has not been accompanied by an increase in the degree of economic diversification.

3- The model used indicates that the impact of the non-oil sector on economic growth is weak and that the economy is therefore a quarterly one in the Kingdom. The contribution of the oil sector has the lion's share. Therefore, the revenues of the oil sector can be utilized to achieve and generate broad economic development that encompasses all economic sectors, i.e., by focusing on diversification and orientation towards investment in other sectors in the long term.

4- The necessary measures for economic diversification are still not in depth since the oil sector is the main sector in the Saudi economy and the main source of revenue, which exposes it to a permanent risk of external shocks.

5- Economic Growth Function Has High Predictability According To Thiel Varying Test.

6- During the study period, the Kingdom’s economy achieved some of its objectives in diversifying the economic base. The degree of diversification in production

activities increased without achieving similar diversification in exports and government revenues.

Recommendations

1- The success of the economic diversification strategy requires economic structural changes affecting the policies of expansion of current government expenditure and production, oil export and government revenue structure.
2- Strengthen policies by diversifying the State's revenues by imposing various taxes and fees that increase the proportion of revenues.
3- Adopt a package of overlapping policies to reduce dependence on oil and thereby increase the degree of economic diversification by rationalizing current and transformative government spending (donations, support and aid) and linking it to efficiency and performance standards, thereby reducing reliance on oil revenues destined to finance the State's budget and thereby reducing the proportion of oil exports from total exports.

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