# An economic study of the efficiency of agricultural investment and its contribution to agricultural growth in Iraq for the period (2003-2022)

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**Abstract**

The Investment is one of the most important factors that can bring about structural changes in the Iraqi economic structure, and the role of agricultural investment is important in increasing agricultural domestic product. Therefore, economic policies that lead to increasing the total investment of the country in general and agricultural investment in particular must followed to achieve the highest productivity of agricultural products and the highest rates of growth of the agricultural sector in Iraq. The research aimed to identify the role of agricultural investment in agricultural growth in Iraq for the period (2003-2022) and measuring the efficiency of investment in the agricultural sector in Iraq through a set of indicators. The results of the study confirmed that the value of total and agricultural investments has increased annually, a statistically confirmed increase amounting to (0.14) and (2.46) respectively. The efficiency of agricultural investment was measured by calculating the investment rate and it reached (3.46) and it is greater than the correct one, and the return on investment reached ( 0.34) and it less than correct one, the investment multiplier reached (0.10), the settlement factor reached (0.92), and the capital intensification factor reached (0.38), which indicates the inefficiency of agricultural investment in the agricultural sector. The research recommended relying on an expansionary monetary policy to increase the volume of agricultural investment by reducing the price Interest and tax reduction in order to encourage investors to invest in agricultural sector projects.
**Keywords: agricultural investment, agricultural growth, agricultural investment efficiency.**

المستخلص

يعد الاستثمار من أهم العوامل التي يمكن ان تحدث التغيرات الهيكلية في البنيان الاقتصادي العراقي، ودور الاستثمار الزراعي مهم في زيادة الناتج المحلي الزراعي، لذلك يتوجب اتباع السياسات الاقتصادية التي تؤدي الى زيادة الاستثمار الكلي للبلد بشكل عام والاستثمار الزراعي بشكل خاص لتحقيق اعلى انتاجية للمنتجات الزراعية واعلى نسب نمو للقطاع الزراعي في العراق. استهدف البحث التعرف على دور الاستثمار الزراعي في النمو الزراعي في العراق للمدة (2003–2022) وتقييم كفاءة الاستثمار في القطاع الزراعي من خلال مجموعة من المؤشرات. اكدت نتائج الدراسة ان قيمة الاستثمارات الكلية والزراعية قد ازدادت سنويا زيادة مؤكدة احصائيا بلغت (0.14) و(2.46) على التعاقب، ولقد تم قياس كفاءة الاستثمار الزراعي من خلال حساب معدل الاستثمار وبلغ (3.46) وهو أكبر من الواحد الصحيح وكذلك العائد على الاستثمار وبلغ (0.34) وهو اقل من واحد الصحيح ومضاعف الاستثمار وبلغ (0.10) ومعامل التوطن وبلغ (0.92) ومعامل التكثيف الرأسمالي وبلغ (0.38) مما يدل على عدم الكفاءة الاستثمار في القطاع الزراعي. اوصى البحث بالاعتماد على سياسة نقدية توسعية لزيادة حجم الاستثمار الزراعي من خلال خفض سعر الفائدة وخفض الضرائب من اجل تشجيع المستثمرين على الاستثمار في مشاريع القطاع الزراعي.
**الكلمات المفتاحية: الاستثمار الزراعي، النمو الزراعي، كفاءة الاستثمار الزراعي.**

## Introduction

The agricultural sector represents one of the basic and productive sectors in the Iraqi economic structure; it represents a way of living, a source of income, and supply of the agricultural workforce (Al-Attabi & Al-Badri, 2019, 1565). Therefore, it is one of the vital sectors that greatly affects the inputs and outputs of the country's economy (Ahmad & Salim, 2019, 560). This sector goes through various stages, some of which are positive and some of which are negative. Agriculture is one of the main economic activities that contribute to the national economy of the country (Al-Birmani & Daoud, 2017, 285). It providing food security requirements and achieving social and economic welfare (Al-Badri & ALL lessa, 2022, 1244). Agriculture in Iraq is suffering from a major decline due to the interruption of government support in financing agricultural investments and agricultural production requirements (Al-Karawi & AL -Badri, 2018, 45). The agricultural investment has an important role in the growth of the country's economy and its impact on agricultural production is evident (Barzan, & Hammood, 2023, 12). It is contributes to solving many of the problems that the agricultural economy suffers from in Iraq (Bashar, 2022, 75). It should has an important role in developing agricultural sector in Iraq (Habib & Hassan, 2019, 530). The investment is the formation of capital, which represents the increase in production capacity and the investment of funds in fixed assets (Eulwan, 2022, 390). Therefore, it should has a fruitful return (Hamzah & Ahmad, 2017, 630). It is a capital spending on new projects in the public sector, public facilities, and infrastructure (Hassan, 2021, 190). Investment has occupied a prominent role with economic policy makers, especially in developing countries, including Iraq, within the framework of these countries' efforts to achieve comprehensive development (Jubair & Alhiyali, 2018, 545). It is one of the important sectors in macroeconomic and it is developing the national economy (Khadir & Hussein, 2022, 11). Agricultural investment is use of factors of production from land, labor, and capital, and their operation for producing agricultural products in order to meet the needs of consumers (Mahmoud, 2018, 590).

Investment employed in the agricultural sector is one of the main determinants of the growth rate in this sector (Mohammed & Yahya, 2014, 1178). As it depends on the available investment, the potential for developing production methods and the level of technology used in agriculture (Shafiq & Jasem, 2022, 198). In addition, adding potential new agricultural lands (Salem, 2018, 45).

## Importance of the study

Agricultural investment considered a driving tool for agricultural development. The increasing in agricultural investment and raising its efficiency are important factors for achieving economic and social growth in Iraq. Raising the volume and efficiency of the agricultural investment would lead to increase agricultural growth, which will reflect positively in achieving food security and increase the efficiency of exploitation of available resources, and despite the availability of land, human, technical and material resources, the agricultural sector has not received sufficient attention as a result of the weak level of investments directed to this sector compared to other economic sectors. This is due to the weakness and deficit in financing investment to the agricultural sector and directing capital to the other sectors.

## Study Problem

The agricultural sector in Iraq suffers from the low volume of agricultural investment and its proportion of total investment, which negatively affects the relative importance of agricultural investment in the agricultural domestic product and its role in the growth of the agricultural sector in Iraq. It also suffers from not directing many agricultural investments that lead to growth Sustainable development in the agricultural sector in Iraq, and the real problem lies in the inefficiency of investment in most agricultural activities.

**Objectives of the study**

The research aims to identify the impact of agricultural investment on agricultural growth in Iraq during the period (2003-2022) through -

1- The development of total investments and agricultural investments and the percentage of agricultural investment's contribution to total investment.

2- Measuring the efficiency of agricultural investment in Iraq for the period (2003-2022).

**Study hypothesis:** The research assumes that agricultural investments positively affect agricultural growth in Iraq. The criteria for measuring the efficiency of agricultural investments, such as the investment rate, return on investment, settlement coefficient, capital intensification, and investment multiplier, are smaller than correct one, and thus indicate the inefficiency of agricultural investment in Iraq.

**Data sources and analysis method:**

Data relied upon from secondary sources for the period (2003-2022), which obtained from government agencies represented by Ministry of Planning, Central Organization of Statistics, Ministry of Finance, master's theses and doctoral dissertations related to the research. As for the analysis method, the descriptive method and the quantitative method used, via using criteria for the efficiency of agricultural investments such as the investment rate, return on investment, settlement factor, capital intensification, and investment multiplier.

**Discuss and analyze the results**

**First: Development of total investments and agricultural investments in Iraq for the period (2003-2022):**

1- Development of total investments in Iraq during the period (2003-2022)

Table (1) shows that the total investments ranged from a minimum of (3,105,450)

million dinars in 2003 and a maximum of (69,373,186) million dinars in 2013, with an average of (28,206,664) million dinars during the study period. The results of the analysis indicate the general trend as in Table (2) that total investments are increasing annually with statistically confirmed increases amounting to about (0.1458).

2- Development of agricultural investments in Iraq during the period (2003-2022).

Table (1) shows that the total agricultural investments ranged between a minimum of (210,986) million dinars in 2003 and a maximum of (2,440,258) million dinars in 2013, with an average of (1,102,380) million dinars during the study period. The results of the general time trend analysis indicate in table (2) that agricultural investments increase annually with a statistically confirmed increase of about (2.46).

3- Percentage of agricultural investments' contribution to total investments:

Agricultural investments contributed to total investments at an annual average of (4.10%) during the study period, with a minimum of (0.97%) in 2019 and a maximum of (7.28%) in 2009, as shown in Table (1).

### Table (1) The variables used in the study for the period (2003-2022)

| Years | Total Investments (Million I.D.) (1) | Agricultural Investments (Million I.D.) (2) | Ratio of agricultural investment from total investment% (3) | Agricultural Labor (4) | GDP (Million I.D.) (5) | Agricultural Product (Million I.D.) (6) |
|---|---|---|---|---|---|---|
| 2003 | 3105450 | 210986 | 6.79 | 1123847 | 49585786 | 2486865 |
| 2004 | 5752212 | 270535 | 4.70 | 1259575 | 63235357 | 3693768 |
| 2005 | 6131500 | 272863 | 4.45 | 1731942 | 93533596 | 5064158 |
| 2006 | 12177645 | 319477 | 2.62 | 1902403 | 115879548 | 5568985 |
| 2007 | 12723770 | 391889 | 3.00 | 1889025 | 131455834 | 5494212 |
| 2008 | 30708376 | 1511113 | 4.92 | 2063966 | 180260616 | 6042017 |
| 2009 | 15083112 | 1098255 | 7.28 | 2361736 | 120432004 | 6832552 |
| 2010 | 25683415 | 1633233 | 6.36 | 2841695 | 160645655 | 8366232 |
| 2011 | 38212790 | 2310672 | 6.05 | 3414911 | 252117174 | 9918316 |
| 2012 | 52330408 | 2354542 | 4.05 | 3609252 | 264225407 | 10484949 |
| 2013 | 69373186 | 2440258 | 3.52 | 4489802 | 262095892 | 13045856 |
| 2014 | 51837742 | 1814321 | 3.50 | 4366789 | 244203845 | 13128622 |
| 2015 | 40741804 | 1678400 | 4.12 | 2812662 | 138761918 | 8160769 |
| 2016 | 25620062 | 1748322 | 6.82 | 2698671 | 215020551 | 7832046 |
| 2017 | 27867213 | 1684033 | 6.04 | 2273986 | 199328771 | 6598384 |
| 2018 | 31777415 | 332113 | 1.05 | 2183572 | 184370413 | 6322747 |
| 2019 | 27649235 | 267567 | 0.97 | 3679274 | 199573245 | 8766710 |
| 2020 | 29097954 | 761237 | 2.61 | 2712277 | 194424143 | 7229280 |
| 2021 | 29508201 | 453639 | 1.53 | 3215500 | 192789267 | 7439579 |
| 2022 | 28751796 | 494147 | 1.71 | 3099311 | 195595551 | 7811856 |
| Average | 28206664 | 1102380 | 4.10 | 22345552 | 172876728 | 7514395 |

Source: Ministry of Planning / Central Organization of Statistics / Directorate of National Accounts, Years of Study, Baghdad.

* The proportion of agricultural investment from the total investment calculated by the researchers.

### Table (2) General time trend of total investment and agricultural domestic product during the period (2003-2022)

Dependent Variable: Y
Method: Least Squares
Date: 03/07/24  Time: 16:20
Sample: 2003 2022
Included observations: 20

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| X1 | 0.145845 | 0.015389 | 9.477359 | 0.0000 |
| C | 3400585. | 502561.8 | 6.766502 | 0.0000 |

| | | | |
|---|---|---|---|
| R-squared | 0.833056 | Mean dependent var. | 7514395. |
| Adjusted R-squared | 0.823781 | S.D. dependent var. | 2698364. |
| S.E. of regression | 1132732. | Akaike info criterion | 30.81280 |
| Sum squared resid | 2.31E+13 | Schwarz criterion | 30.91238 |
| Log likelihood | -306.1280 | Hannan-Quinn criter. | 30.83224 |
| F-statistic | 89.82033 | Durbin-Watson stat | 2.427464 |
| Prob.(F-statistic) | 0.000000 | | |

Source: Outputs of the statistical program (Eviews12).

$$Y = 3400585 + 0.1458*X1$$

It appears from the results of the regression table (2) that the relationship between the two variables is a linear relationship, as it is inferred from the estimate that the variable The investment is 0.1458, while the constant parameter shows that in the absence of agricultural domestic product, the total investment would be 3,400,585.

Y indicates the dependent variable, which is the agricultural domestic product during the study period, and x1 indicates total investment, and the calculated F reached (89.82) and it is significant at a significance level (1%), and $R^2$ reached a value of 0.83.

**Table (3) Lagrangian multiple test LM**

| Breusch-Godfrey Serial Correlation LM Test: | | | |
|---|---|---|---|
| Null hypothesis: No serial correlation at up to 2 lags | | | |
| F-statistic | 0.285624 | Prob. F(2,11) | 0.7570 |
| Obs*R-squared | 1.481037 | Prob. Chi-Square(2) | 0.4769 |

Source: Outputs of the Statistical Program  Eviews12

The results showed no autocorrelation in light of the LM test. Suppose the (LM) test results show a probability value of (0.4769). Among them, we can accept the null hypothesis that the model does not suffer from the problem of autocorrelation and that the model is good and has no serial autocorrelation of errors

. **Table (4) Heteroskedasticity test**

| Heteroskedasticity Test: Breusch-Pagan-Godfrey | | | |
|---|---|---|---|
| Null hypothesis: Homoskedasticity | | | |
| F-statistic | 0.188660 | Prob. F(27,1) | 0.9707 |
| Obs*R-squared | 24.24107 | Prob. Chi-Square(27) | 0.6169 |
| Scaled explained SS | 0.056663 | Prob. Chi-Square(27) | 1.0000 |

Source: Outputs of the Statistical Program  Eviews12

The calculated F value of (0.18), which is significant (0.97), was obtained. The test results on the model confirmed that the Chi-Square statistic was (0.61). It is greater than (0.05) as well. Therefore, the null hypothesis is accepted. That is, there is no problem of instability of the variance homogeneity of the model.

**Table (5) The general time trend in agricultural investment and agricultural domestic product during the period (2003-2022)**

| Dependent Variable: Y | | | | |
|---|---|---|---|---|
| Method: Least Squares | | | | |
| Date: 03/08/24   Time: 15:12 | | | | |
| Sample: 2003 2022 | | | | |
| Included observations: 20 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 4800330. | 723414.6 | 6.635655 | 0.0000 |
| X2 | 2.462005 | 0.534358 | 4.607405 | 0.0002 |
| R-squared | 0.541146 | Mean dependent var. | | 7514395. |
| Adjusted R-squared | 0.515654 | S.D. dependent var. | | 2698364. |
| S.E. of regression | 1877925. | Akaike info criterion | | 31.82387 |
| Sum squared resid. | 6.35E+13 | Schwarz criterion | | 31.92345 |
| Log likelihood | -316.2387 | Hannan-Quinn criter. | | 31.84331 |
| F-statistic | 21.22818 | Durbin-Watson stat | | 1.060646 |
| Prob.(F-statistic) | 0.000219 | | | |

Source: Outputs of the statistical program (Eviews12)

$$Y = 4800330 + 2.46200 * X2$$

Y refers to the dependent variable, which is the agricultural domestic product during the study period, x2 refers to agricultural investment, and the calculated F reached (21.22), which is significant at a significance level (1%), $R^2$ reached 0.54, or 54%. Thus, we see that total investment is the most influential in the agricultural domestic product (which it is representing agricultural growth) than the agricultural investments, but if we consider government support and government subsidies to the agricultural sector as part of the total investment, then they have the greatest impact on agricultural growth (agricultural domestic product) than agricultural investment.

### Second: Development of gross domestic product and agricultural domestic product:

1- GDP development:
  Data from table (1) indicate that the total gross domestic product ranged between a minimum of (49,585,786) million dinars in 2003, with a maximum of (264,225,407) million dinars in 2012, with an average of about (172,876,728) million dinars during the study period.
2- Development of agricultural domestic product:
  Data from table (1) indicate that the agricultural domestic product ranged between a minimum of (2,486,865) million dinars in 2003 and a maximum of (13,128,622) million dinars in 2014, with an annual average of about (7,514,395) million dinars during the study period.

### Third: Measuring the efficiency of agricultural investment in Iraq during the period (2003-2022):
### 1- Investment Rate:

The investment rate criterion shows the amount of investment necessary to produce one unit of agricultural domestic product value, and it calculated through the following equation:

**Investment rate** =Total agricultural investment/Gross agricultural domestic product

If the value of this criterion being lower than the correct one, indicates the presence of efficiency in the investment directed to the agricultural sector and vice versa. Table (6), column (1) shows that the agricultural investment rate ranged between a minimum of (0.03)
in 2019 and a maximum of (0.25)
in 2017 year, with an average of (0.15) during the study period. It is clear from the previous results that the investment rate was greater than the correct one, which indicates the inefficiency of investment in the agricultural sector.

### 2 – The return on investment:

The criterion shows investment efficiency, and it is the value of the output generated from one unit of agricultural investment, it calculated through the following equation:

**Return on investment** = Gross agricultural domestic product/gross agricultural investment

An increase in this criterion above the correct one indicates the presence of efficiency in investment, which is the inverse of the investment rate. Table (6), column (2), shows the return on investment, which ranged between a minimum of (4) in 2008,2011,2012,2016,2017 and a maximum of (33) in 2019 with an average rate of (20.66) during the study period. It is clear from the previous results that the return on investment was less than the correct one, which indicates the inefficiency of investment in the agricultural sector.

**3- Investment multiplier:** If this criterion being higher than the correct one indicates the presence of efficiency in investment and vice versa. When the value of the investment multiplier is negative, this means that investment in
the current year was less than investment in the previous year and that the agricultural domestic product in the current year is less than the agricultural domestic product in the previous year , The investment multiplier is calculated through the following equation:

**Investment multiplier** = 1/(1- marginal propensity to consume)  .

Table (6) and column (3) shows that the agricultural investment multiplier ranged between two limits, a minimum of (-1.06) in 2020 and a maximum of (3.61) in 2005, with an average of (0.10) during the study period. The previous results show that the agricultural investment multiplier was less than the correct one, which means there is inefficiency of investment in the agricultural sector.

**4- Endemism coefficient:** The endemism coefficient shows the extent of the agricultural sector's contribution to the gross domestic product according to investment in the agricultural sector by measuring the efficiency of investment, as it calculated through the following equation:
Endemism coefficient = percentage of agricultural investment from total investment/Percentage of agricultural domestic product from gross domestic product.
If the endemism coefficient being lower than the correct one, indicates the presence of efficiency of investment in agricultural sector and vice versa. Table (6) and column (4) shows the endemism coefficient, as it ranged between two limits, a minimum of (0.22) in 2019 and a maximum of (1.87) in 2016, the average reached (0.92) during the study period. From the previous results, it is clear that the endemism coefficient was less than the correct one in some years, which indicates the presence of investment efficiency in the agricultural sector, and it was greater than the correct one in other years, which indicates the lack of investment efficiency. In this sector.

**5- Capital intensification factor :**The capital intensification factor refers to the ratio between total agricultural investment and the number of agricultural workers, and it calculated through the following equation: Capital Intensification Factor= Total agricultural investment/Number of agricultural workers.
If the capital intensification factor being higher than the correct one in the agricultural sector indicates that, this sector is a capital-intensive activity. Table (6) and column (5) shows that the capital intensification factor ranged between two limits, a minimum of (0.07) in 2019 and a maximum of (0.74) in 2017, with an average of (0.38) during the study period. Previous results show that the capital intensification coefficient was less than the correct one, which indicates the lack of efficiency of investment in the agricultural sector in Iraq during the study period.

**Table (6) Criteria for calculating the efficiency of agricultural investment in Iraq for the period (2003-2022)**

| Years | Investment Rate (1) | return on investment (2) | Investment multiplier (3) | Endemism coefficient (4) | Capital intensification factor (5) |
|---|---|---|---|---|---|
| 2003 | 0.08 | 12 | 0.80 | 1.35 | 0.18 |
| 2004 | 0.07 | 14 | 0.45 | 0.80 | 0.21 |
| 2005 | 0.05 | 19 | 3.61 | 0.82 | 0.15 |
| 2006 | 0.05 | 17 | 0.74- | 0.54 | 0.16 |
| 2007 | 0.07 | 14 | 0.13- | 0.71 | 0.20 |
| 2008 | 0.25 | 4 | 0.03 | 1.46 | 0.73 |
| 2009 | 0.16 | 6 | -0.05 | 1.28 | 0.46 |
| 2010 | 0.19 | 5 | 0.14 | 1.27 | 0.57 |
| 2011 | 0.23 | 4 | 0.12 | 1.53 | 0.67 |
| 2012 | 0.22 | 4 | 0.04 | 1.02 | 0.65 |
| 2013 | 0.18 | 5 | 0.15 | 0.70 | 0.54 |
| 2014 | 0.13 | 7 | -0.47 | 0.65 | 0.41 |
| 2015 | 0.20 | 5 | 0.44 | 0.70 | 0.59 |
| 2016 | 0.22 | 4 | 0.02 | 1.87 | 0.62 |
| 2017 | 0.25 | 4 | -0.54 | 1.82 | 0.74 |
| 2018 | 0.05 | 19 | -0.07 | 0.30 | 0.15 |
| 2019 | 0.03 | 33 | -0.59 | 0.22 | 0.07 |
| 2020 | 0.10 | 9 | -1.06 | 0.70 | 0.28 |
| 2021 | 0.06 | 16 | 0.51 | 0.39 | 0.14 |
| 2022 | 0.06 | 16 | -0.49 | 0.42 | 0.15 |
| Average | 0.15 | 20.66 | 0.10 | 0.92 | 0.38 |

Source: From the researchers' calculation based on the data in table (1).
　　(-) The negative sign indicates that the value in the current year was lower than the previous year.

## Conclusions and recommendations

**First: Conclusions:** The research reached a number of conclusions, including:

1- Total and agricultural investments have a positive impact on the agricultural growth through a confirmed statistical increase of (0.14) and (2.46) respectively.

2- The percentage of agricultural investment's contribution to total investment was low during the study period.

3- The efficiency of agricultural investments was less than the correct one for some criteria, including (the return on investment, the investment multiplier, and the capital intensification factor)، while it was greater than the correct one and less than one for the criteria, including (the investment rate, the settlement factor)، which indicate the inefficiency of investment in agricultural sector.

## Second: Recommendations

1- Follow an expansionary monetary policy in order to increase the volume of agricultural investment directed to the agricultural sector.

2- Raising the efficiency of agricultural economic resources and thus increasing agricultural production.

3- Encouraging investment in the agricultural sector, reducing interest rates and reducing taxes in order to encourage investors to invest in agricultural projects.

## References

1. Al- Badri, B.H. & ALL lessa, D.E.S. (2022). An economic analysis to estimate imported inflation in the agricultural sector in Iraq for the period 1990-2019.*Iraqi Journal of agricultural Sciences*, 53, (5), 1241-1254.

2. Ahmad, A.F &. Salim, Y.A. (2019). Impact of monetary policy on agricultural domestic product in Iraq (1990-2014). *Iraqi Journal of Agricultural Sciences*, 50, (2), 557-566.

3. Al-Birmani, S .M. & Daoud, M.N. (2017). The impact of government consumption spending on the status of the current account balance in Iraq (1990-2014) using the ARDL model. *Journal of Economic and Administrative Sciences*, 23, (98), 280-307.

4. Al-Sumaidaie, N.M. (2022). An economic analysis of the Factors affecting the demand for government agricultural Lending and its impact on agricultural domestic product in Iraq .Master Thesis .College of Agricultural Engineering Sciences. Department of Agricultural Economics.

5. Al-Attabi , H.A & . AL Badri, B.H. (2019). An economic analysis of the most important factors affecting agricultural growth in Iraq using ARDL model. *Iraqi journal of Agricultural Sciences*, 50,(6),1561-1570.

6. Al-Karawi ,H.A & AL Badri, B.H.(2018).An economic Study for Iraq rice imports for the period (1990-2015) and prediction for the period (2016-2023). *Iraqi Journal of agricultural Sciences*, 49, (1), 43-49.

7. Al-khafaji, S. D. & Jary., W. W.(2016). The efficiency of public investment spending and its impact on Iraq's economic growth from 2003-2013. *Journal of Economic and Administrative Sciences*.Vol.97 (23): 314-293.

8. Al- Aqidi, M.A.K .2005. The reality of agricultural investment in the Republic of Iraq and its prospects.Iraq Agricultural Journal. 3,(7):1662-1672

9. Ali, R.H. 2017.The role of investment in revitalizing the agricultural sector in Iraq. Faculty of Administration and Economics. Wasit University . 26,(1): 16-31 .

10. structure of the Iraqi economy after 2003. Journal of Management and Economics.123.(7):18-39

11. ALL lessa, D. E. S . and B. H. Al Badri. 2022. An economic analysis to estimate imported inflation in the agricultural sector in Iraq for the period 1990-2019.Iraq Journal of Agricultural Sciences.53,(5):1248-1241.

12. Ali, S.N, and D. A. A. H. Aleaqabiu. 2018. Agricultural requirements in Iraq in light of its accession to the World Trade Organization. Journal of Economic and Administrative Sciences. 24. (24): 272-294

13. Barzan, S& Hammood ,A.F.(2023).The impact of the progressive income tax on inflation in Iraq for the period 1995-2020.*Journal of Accounting and financial studies,* 18(3),10-17.

14. Bashar, D.M.(2022).Geographical distribution of labor in Iraq ( agricultural workers).*Journal of Al-Isra University College of Social and Human Sciences* ,4,(7),98-73.

15. Eulwan, G.H & Talib, R.A. (2022). Analysis of the relationship between the public budget deficit and external debt in Iraq (1990-2016). *Journal of Economic and Administrative Sciences*, 25, (113), 385-406.

16. Edgeman, M. 1999. Macroeconomics Theory And Policy.Translated by Muhammad Ibrahim Mansour.Riyadh.Saudi Arabia.Mars Publishing House.p.127

17. Fadil, S.A.2021.Challenges of external debtedness in Iraq after 2020. Journal of Development and Foresight for Research and Studies.Vol.1 (6).

18. Habib, A.S. & Hassan, H.J. (2019). Using the autoregressive distributed deceleration ARDL  model in analyzing the causal relationship between human capital and gross domestic *product  Journal Iraqi economic environment*,31 (8), 536-506.

19. Hamzah, A.M& Ahmad, A.F. (2017). Determinants of Private agricultural investment in Iraq for the period (1990-2014). *The Iraqi Journal of Agricultural Sciences*, 48, (2), 624-635.

20. Hassan, R. k. (2021) .Measuring the impact of the age structure of the population on GDP .*Journal of Economic and Administrative Sciences*, 19, (72), 198-188.

21. Jubair, B.N& Alhiyali,  A.D.K   .(2018).An Economic Study of the Impact of Foreign Agricultural Trade and some Macro Economic Variables on the Exchange Rate in Iraq using the FMOLS model (1990-2015). *Iraqi Journal of Agricultural Sciences,* 49, (4), 541-550.

22. Khadir, M.Y& Hussein, W.A. (2022). The efficiency of foreign reserves and their role in Stabilizing Iraqi dinar exchange rate .*Journal of Accounting and Financial Studies*, 17, (60), 10-22.

23. Khalaf, B.J. 2014. The importance of agricultural investment in achieving food Security in Iraq. Journal of Economics. 5.(5):1-20

24. Khalil, Z.K. and S .N .Nowruz .2019. Reforming the reading of the public budget in Iraq according to allocation efficiency criteria in an analytical study for the period (2004-2018). Journal of Economic and Administrative Sciences. 26. (119): 392-404.

25. Mahmoud, K.S. (2018). The application of the ARDL autoregressive model to study the co-integration relationship between the prices of chicks and broiler chickens in Egypt for the period 2015-2018 .*Menoufia Journal agricultural   economic social* , 94(30), 595-614.

26. Mohammed, D .M. & Yahiya, Y.A.R. (2014).Econometric analysis of agricultural investment in Egypt. *The Egyptian Journal of agricultural research*, 92, (3), 1175-1206.

27. Shafiq , H.R& Jasem ,Y.H.(2022) .The  impact of  inflation  and  tourism services on unemployment in Iraq for the period 2003- 2018 . *Journal of Baghdad University College of Economic Sciences*, 68(6), 196-185.

28. Salem, Y.A. (2018). An economic analysis of some monetary policy indicators on agricultural GDP in Iraq for the period (1990-2016) .Master Thesis .College of Agricultural Engineering Sciences .Department of Agricultural Economics.

29. Saqr, A. S. 1983. Macro-economic theory, Public action agenc.Muhannad street. Kuwait. Second Edition.p.228.

30. Saleh, H. A. and A .Q. Nayef. 2021. Analysis of the impact of oil and tax revenues on Iraq's public revenues for 2003-2018.Baghdad College Journal of economic sciences. 66.(7):85-95 .