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ANALYZING PRIVATE FIXED CAPITAL FORMATION TRENDS IN IRAQ 2012-2021

Dr. Fatimah Faraj Saad
Wasit University, Faculty of Administration and Economics
Email: ffaraj@uowasit.edu.iq

Abstract
The present study aims to identify the private sector's contribution to fixed capital formation in Iraq, as it is a highly important variable in the national economy. It provides an image of the investment plan of the country. It is also considered an indicator of the integrated economic plan that reflects productive capacities. The present study reveals that the private sector contributes little to fixed capital formation, amounting to (31.64%), compared to the public sector's contribution of (68.35%). As for the stock of private fixed capital, its average is (21,888.65) billion dinars, and its productivity average is (4.509) billion dinars during the research period. One of the most important recommendations is to encourage the private sector to invest in economic sectors in order to develop the total private fixed capital formation for the purpose of increasing production by providing an appropriate legal and legislative environment and protecting and guaranteeing the rights of investors.

Introduction

The fixed capital formation index is of great importance as it constitutes an effective factor in the economic development process. It determines the level and rate of growth in national income, characterized by a high capacity for expansion through the initiation and continuation of investment and savings operations. Private sector investment policy has been characterized by a lack of diversity and stability in traditional patterns. This has not been reflected in the effective level of economic activity due to the applied economic policies, unpromising legal legislation, and reliance on government support. With the continued growth of the public sector, it has become difficult to complete its projects and activities, leading to a weak contribution to fixed capital formation.

Problem Statement

The private sector's contribution to fixed capital formation is declining. Despite the emphasis on its role in local economic activity, it remains linked to the general political and economic conditions of the country.

The Hypothesis

The weak contribution of the private sector to fixed capital formation leads to a decline in its role in driving production and achieving economic growth in the country.

The Objectives

The present study aims to provide an understanding of the concept of fixed capital formation and its economic importance, in addition to analyzing trends in private fixed capital formation in Iraq 2012-2021.

Section One

The Concept, Importance, and Types of Fixed Capital Formation

First; The Concept of Fixed Capital Formation

The term fixed capital formation refers to one of the macroeconomic concepts used in official national accounts, such as the United Nations System of National Accounts and the European Union Accounting System. This term first appeared in studies by the National Bureau of Economics to express capital formation in the 1930s. Its standard measures were adopted in the 1950s (Kuznets, 1963). The process of spending on capital is nothing but an important economic process called capital formation, which means establishing new projects and expanding existing facilities with financing from previous savings and using the accumulated depreciation allocations of the industrial facility. Accordingly, the formation of fixed capital means spending on purchasing equipment and machinery, establishing production and residential buildings, and purchasing means of transportation and furniture (Salah, 2023). It is defined as the percentage of actual income that is saved and invested to increase production and revenues in the future (Bakare, 2011). It is also defined as the process by which a society allocates a portion of its resources to the production of capital goods such as machinery, transportation infrastructure, factories, equipment, tools, devices, and all other real capital that can significantly increase the effectiveness of productive effort (Owolabi and Ajayi, 2013). It is called gross because the measure does not make any adjustments to deduct fixed capital consumption (depreciation of fixed assets) from investment figures. Gross fixed capital formation is not a measure of gross investment because only the value of net additions to fixed assets is measured and all types of financial assets are excluded (Kanu, and Nwaimo, 2015). The Iraqi Ministry of Planning defines gross capital formation as the sum of annual additions to fixed assets less assets that have been disposed of. Accordingly, gross fixed capital formation includes both tangible fixed assets, which include residential and non-residential buildings, construction, machinery, equipment, furniture, and transportation. It also includes intellectual property products and major improvements to non-productive assets, including land, as well as the costs associated with transferring ownership of assets (Ministry of Planning, 2025). Capital accumulation is defined as the actual net additions to the economy in the form of facilities, equipment, and stocks of primary resources and goods. These additions represent an increase in a country's production capacity, and consequently an increase in the average per capita share of goods and services, i.e., a rise in the standard of living. This is what is meant by the term economic growth (Tawfiq, 2011).

Second; The Importance of Gross Fixed Capital Formation

Gross fixed capital formation is one of the most prominent economic variables, playing a vital and influential role in the economies of both developed and developing countries. It represents one of the pillars of economic growth, responsible for both the positive and negative aspects

of its trends, and a key determinant in creating new productive capacity (Ministry of Planning, 2013). It is characterized by a high capacity for expansion through the initiation and continuation of investment and savings operations. Furthermore, increased capital is reflected in increased productivity of other production factors, such as land and labor. Therefore, it is a motivating factor for increased productivity as a reward for savers, for their sacrifice and the resulting postponement of current consumption (Ministry of Planning, 2022). It is also considered an important economic indicator that guides planners when drawing up economic programs. It reflects the volume of annual investments and the structure of their distribution across economic activities (Abdulmunim, 2007).

Third; Types of Gross Fixed Capital Formation

Two types of gross fixed capital formation can be distinguished (Ministry of Planning, 2022):

1. **Public Gross Fixed Capital Formation;** This type refers to the state's expenditures on purchasing investment goods to build and expand existing fixed capital with the aim of increasing society's productive capacity. The importance of public investment is highlighted in developing countries because the state controls most ownership of production resources, and various economic sectors require significant investments in infrastructure.
2. **Private Gross Fixed Capital Formation;** This type refers to spending by individuals and companies to build fixed capital or expand available production capacities, which are often short-term investment projects with quick returns. Private investment is the addition to society's available productive capacity and is undertaken by private organizational national or foreign units or joint ventures. It is called a private investment project with the aim of achieving quick profits within a short period of time.

Section Two

Analyzing the Stock and Productivity of Private Fixed Capital in Iraq

First; Relative Importance of the Public and Private Sectors in Gross Fixed Capital Formation

Table (1) shows the contribution of the public and private sectors to gross fixed capital formation in Iraq (2012-2021). It is noted that there is an expansion in the public sector's contribution to gross fixed capital formation at a relative rate of (68.35%), while the private sector's contribution relative rate is (31.64%) during the research period. This has led the public sector to dominate the investment process due to the government's ability to finance investment projects, especially service projects. In contrast, the private sector's contribution is weak, due to several reasons that have contributed to its reluctance to participate effectively in investment, including the lack of an investment environment that encourages its work except in limited areas, most of which are short-term commercial and quickly recoverable, for fear of currency devaluation, lack of funding and liquidity, difficulty obtaining credit, poor security, weak implementation of laws, administrative and financial corruption, and deterioration of infrastructure (Al-Iqabi, 2015).

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Table (1) Relative importance of the public and private sectors in the gross fixed capital formation in Iraq at current prices for the period (2012-2021) / billion dinars

Year	Gross Fixed Capital Formation 1	Public Sector 2	Private Sector 3	Relative Importance of Public Sector (%) 4	Relative Importance of Private Sector (%) 5
2012	41956.4	39825.8	2130.5	94.9	5.1
2013	63618.0	53640.5	9977.5	84.3	15.7
2014	55837.4	41889.6	13947.8	75.0	25.0
2015	50650.6	33838.6	16812.0	66.8	33.2
2016	28703.1	17389.5	11313.6	60.5	39.5
2017	32330.3	17503.5	14826.7	54.1	45.9
2018	38107.2	26714.1	11393.1	70.1	29.9
2019	54580.0	43124.6	11455.4	79.0	20.9
2020	16754.9	7464.9	9290.0	44.6	55.4
2021	24825.3	13468.0	11357.2	54.2	45.8
Average Period				68.35	31.64

Source; Columns (1, 2, 3) Ministry of Planning, Department of Economic and Financial Policies, Iraqi Economic Report, various years.
Columns (4, 5) are done by the researcher.

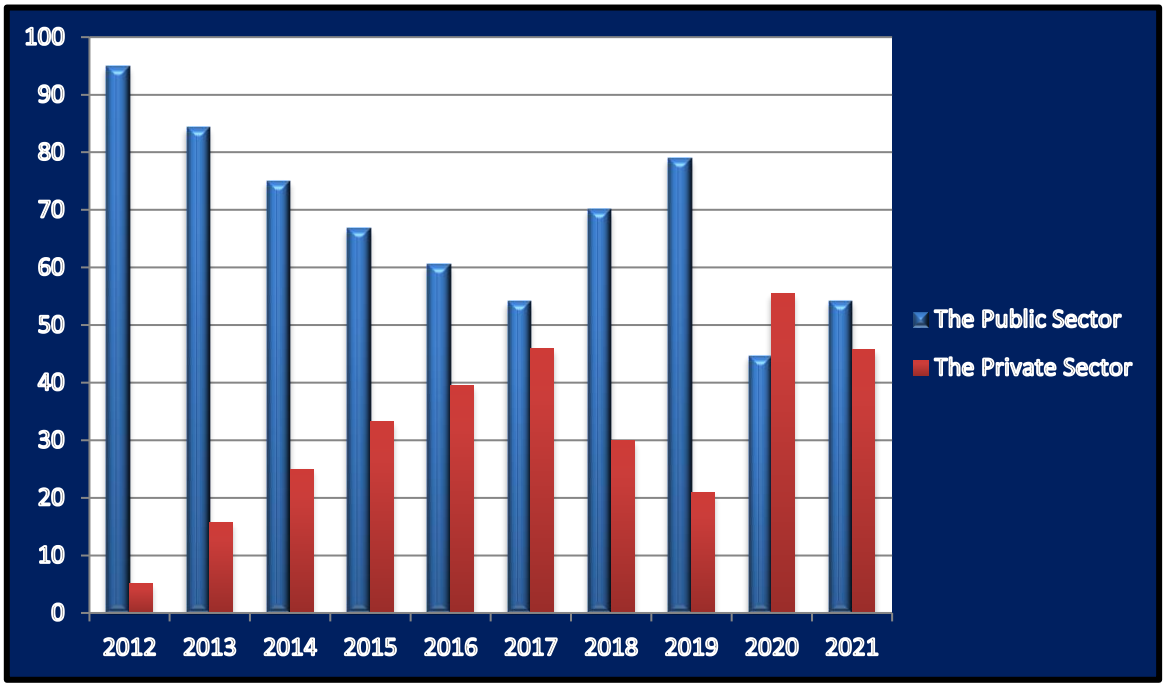

Figure (1) Relative importance of public and private sectors in gross fixed private capital formation in Iraq 2012-2021

Source; The researcher based on Table (1).

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Second; Gross Private Fixed Capital Formation by Type of Asset 2012-2020

Table (2) shows the percentage of private sector contribution to private assets in fixed capital formation in Iraq. The largest investments are concentrated in residential buildings, contributing (10.6%) of total investments in this sector, followed by furniture and office equipment, contributing(3.0%), machinery and equipment, contributing(2.5%), and transportation, contributing(2.3%).

Table (2) The percentage of private sector contribution to private assets in gross fixed capital formation in Iraq 2012-2020

Period	Residential Buildings	Non-Residential Buildings	Other Constructions	Means of Transport	Machinery and Equipment	Furniture and Office Equipment	Intangible Assets	Other Assets
2012-2020	10.6	2.2	1.1	2.3	2.5	3.0	0.0	0.1

Source; Ministry of Planning, Central Statistical Agency, National Accounts Directorate, data series.

Second; Analyzing the Private Fixed Capital Stock in Iraq

The fixed capital stock can be calculated according to the following formula:

$$\mathbf{Kt = K_{t-1}(1-\delta) + I_t}$$

As

Kt = Fixed Capital Stock

Kt-1 =Initial Stock

δ =Capital Depreciation Rate

$\mathbf{I_t}$= Gross Fixed Capital Formation =

As for the depreciation rate of capital assets in the Iraqi economy, it is calculated in a simple way, assuming that all forms of capital are consumed at a constant rate. In practice, the accepted average is 5% per year. Therefore, the gross accumulated capital in the Iraqi economy is equal to:

$$\mathbf{Kt = 0.95k_t + I_t}$$

Constructing the time series for the capital stock requires determining the value of the capital stock in the initial period (K_0) by calculating the average accumulation over the first five years of the study period.

1. **Analysis of the private fixed capital stock at the level of the Iraqi economy as a whole 2012-2021**

Table (3) shows the fixed capital stock in the Iraqi economy, which witnessed fluctuations between rise and fall. It began to rise from (12,424.8) billion dinars to (30,062.4) billion dinars (2012-2015). It then began to decline from (27,285) billion dinars to (20,172.6) billion dinars during the period (2016-2020). Then, it rose again in 2021, reaching (20,182.7) billion dinars. It reached its highest value in (2015), with (30,062.4) billion dinars, with a growth rate of (28.3%), as a result of the increase in the gross fixed capital formation of (16,812.0) billion dinars. This increase does not represent a real increase, i.e., the creation of productive

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capacities, as much as it compensates and covers the effects of the physical destruction and technical decline that affected the productive capacities that actually existed.

Table (3) Private fixed capital stock in the Iraqi economy as a whole at current prices 2012-2021 / billion dinars

Year	Gross Private Fixed Capital Formation 1	Private Fixed Capital Stock 2	Inventory Growth Rate 3
2012	2130.5	12424.8	-
2013	9977.5	12001.4	-3.4
2014	13947.8	23426.4	95.1
2015	16812.0	30062.4	28.3
2016	11313.6	27285.0	-9.2
2017	14826.7	25574.6	-6.2
2018	11393.1	25477.8	-0.3
2019	11455.4	22278.8	-12.5
2020	9290.00	20172.6	-9.4
2021	11357.2	20182.7	0.1
Average Private Fixed Capital Stock		21888.65	

Source: Column (1) is based on data from Table 1.
Columns (2, 3) are done by the researcher's.

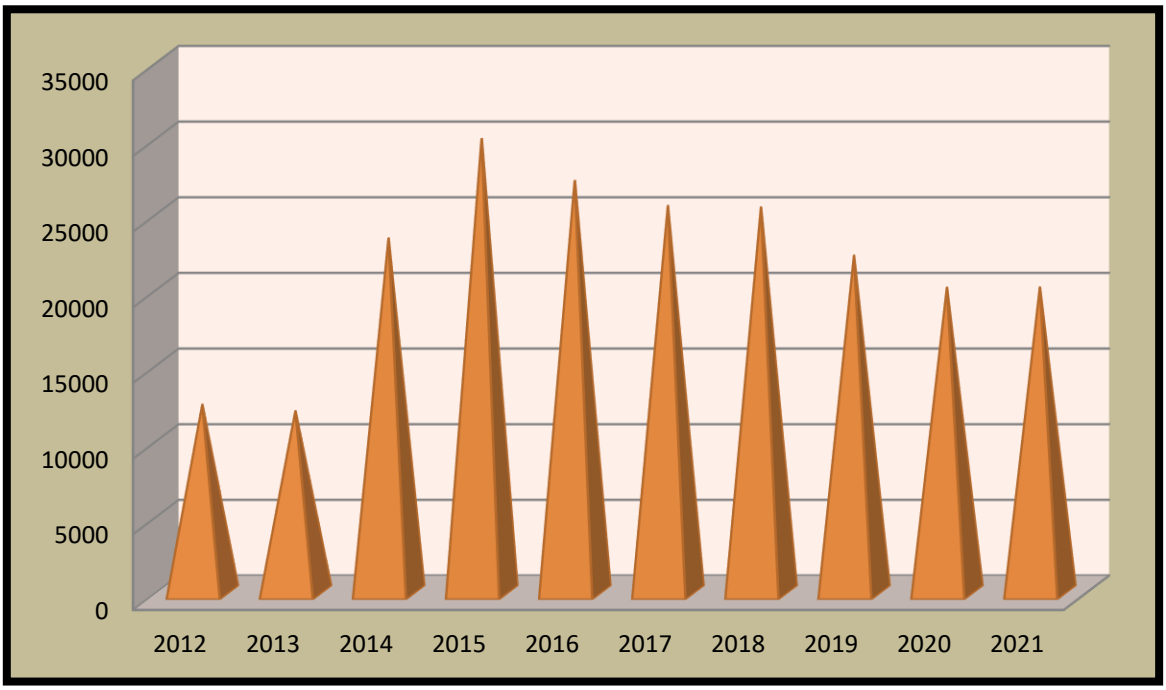

Figure (2) Private fixed capital stock in the Iraqi economy 2012-2021
Source: The researcher based on Table (3).

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2. Analyzing the private fixed capital stock at the level of the major economic sectors 2012-2021

The private fixed capital stock at the level of the major economic sectors fluctuated between rise and fall during the research period. For the agricultural sector, it reached its highest value of (134.9) billion dinars in 2021, while its lowest value reached (80.8) billion dinars in 2020. Growth rates were mostly negative, declining from (185.2%) in 2013 to (66.9%) in 2021. As for the industrial sector, the value of the private capital stock began to rise (2013-2017), reaching its highest value of (4944.6) billion dinars in 2017, with a growth rate of (189.2%). After that, it began to decline (2018-2021). The lowest value reached (248.2) billion dinars in 2021, with a negative growth rate of (89.1%). As for the services sector, the value of the inventory increased at the beginning of (2013-2017) and decreased at the end of (2018-2021). It reached its highest value of (4596.8) billion dinars in 2016 and its lowest value of (290.7) billion in 2019. As for the growth rates, they increased from negative (87.8) in 2013 to (57.4) in 2021 as shown in Table (4).

Table (4) Private fixed capital stock in Iraq across major sectors at current prices 2012-2021 / billion dinars

Year	Gross Fixed Capital Formation in Major Sectors			Inventory and Annual Growth Rates in Major Sectors					
	Agriculture	Industry	Services	Agriculture	The growth rate	Industry	The growth rate	Services	The growth rate
	1	2	3	4	5	6	7	8	9
2012	0.05	16.1	20.3	219.9	-	478.0	-	1123.7	-
2013	627.1	242.7	117.5	627.2	185.2	257.9	-46.0	136.7	-87.8
2014	210.8	439.0	885.9	806.5	28.5	669.5	159.5	997.5	629.7
2015	159.4	485.5	3743.8	359.6	-55.4	902.5	34.8	4585.4	359.6
2016	160.3	1248.4	1040.2	311.7	-13.3	1709.6	89.4	4596.8	0.2
2017	599.4	3758.7	796.9	751.6	141.1	4944.6	189.2	1785.0	-61.1
2018	86.6	687.7	152.5	656.0	-12.7	4258.4	-13.8	909.5	-49.0
2019	37.0	2289.9	145.9	119.2	-81.8	2943.2	-30.8	290.7	-68.0
2020	45.7	109.9	166.7	80.8	-32.2	2285.3	-22.3	305.3	5.0
2021	91.5	143.8	322.5	134.9	66.9	248.2	-89.1	480.8	57.4
Average Period				406.74		1869.72		1521.14	

Source; Columns (1, 2, 3) Ministry of Planning, Department of Economic and Financial Policies, Iraqi Economic Report, various years.
Columns (4, 5, 6, 7, 8, 9) are done by the researcher.

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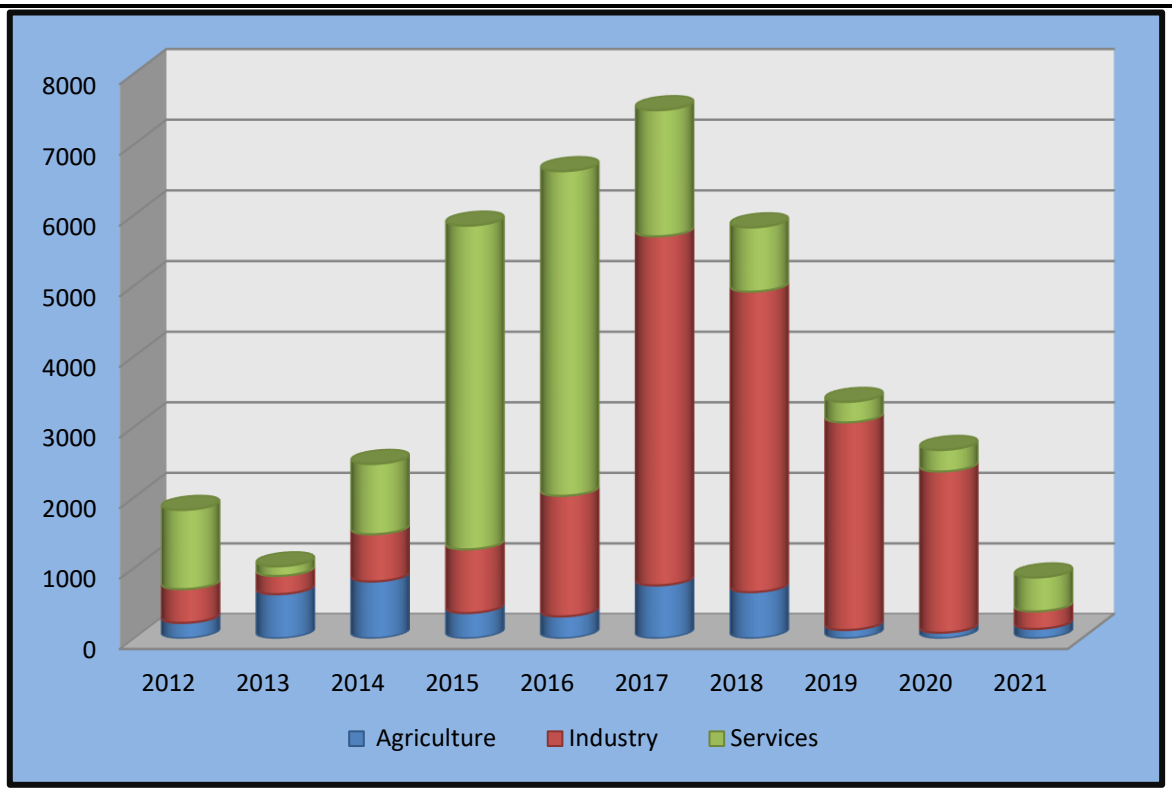

Figure (3) Private fixed capital stock across major economic sectors 2012-2021

Source; The researcher based on data from Table (4).

Third; Analyzing the productivity of private fixed capital in Iraq

1. **Analyzing the productivity of private fixed capital at the level of the Iraqi economy 2012-2021**

Table (5) indicates that there is a disparity in the productivity of private fixed capital for the Iraqi economy during the research period. It ranged between a lowest value of (2.73) billion dinars in 2015 and a highest value of (7.25) billion dinars in 2013. It then began to decline during the years (2014-2015) due to the decline in the private gross domestic product. This can be attributed to the unstable security situation in Iraq during these two years. After that, productivity began to rise from (3.09) billion dinars in 2016 to (5.25) billion dinars in 2021. As for growth rates, they recorded a negative growth rate during the years (2012-2015). (2014-2015) Then, they began to rise from (13.1%) in 2016 to (27.0%) in 2019, which was the highest growth rate recorded by productivity during the research period. It then declined to (5.9%) in 2020 due to the Corona pandemic. It then rose in 2021 to (8.9%) due to the rise in private GDP and the increase in private fixed capital stock.

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Table (5) Private fixed capital productivity across the Iraqi economy at current prices 2012-2021, billion dinars

Year	Private GDP 1	Private Capital Stock 2	Private Capital Productivity 3	Productivity Growth Rate 4
2012	78309.5	12424.8	6.30	-
2013	87111.1	12001.4	7.25	15.0
2014	96850.4	23426.4	4.13	-43.0
2015	82125.2	30062.4	2.73	-33.8
2016	84446.1	27285.0	3.09	13.1
2017	86716.4	25574.6	3.39	9.7
2018	91297.6	25477.8	3.58	5.6
2019	101414.8	22278.8	4.55	27.0
2020	97234.5	20172.6	4.82	5.9
2021	106091.8	20182.7	5.25	8.9
Average Private Fixed Capital Productivity			4.509	

Source; Column (1) Ministry of Planning, Department of Economic and Financial Policies, Iraqi Economic Report, various years.
Column (2) Data from Table (2).
Columns (3, 4) are done by the researcher.
Productivity was calculated according to the following formula:
(private fixed capital productivity = private GDP / total private capital stock)

2. Analyzing private fixed capital productivity at the level of the major economic sectors 2012-2021

The major economic sectors recorded variations in private fixed capital productivity during the research period as shown in Table (6). As for the agricultural sector, it recorded its highest value of (159.04) billion dinars in 2020, and its lowest value of (8.67) billion dinars in 2017. As for the industrial sector, its highest value was (306.96) billion dinars in 2012, then it began to decline until it reached (0.79) billion dinars in 2017. After that, its lowest value began to rise to (29.88) billion dinars in 2021. As for the services sector, it also varied between rising and falling, with its highest value of (36.38) billion dinars in 2020, and the lowest value was (1.40) billion dinars in 2015. Regarding growth rates, the agricultural sector recorded the highest productivity growth rate at (658.9%) in 2019. The industrial sector had its highest growth rate at (408.8%) in 2018. The services sector had its highest growth rate at (484.8%) in 2013.

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Table (6) Private fixed capital productivity across major economic sectors at current prices 2012-2021 / billion dinars

Year	Private Sector GDP Across Sector (1)			Private Sector Capital Stock Across Sector (2)			Private Sector Fixed Capital Productivity Across Sector (3)		
	Agriculture	Industry	Services	Agriculture	Industry	Services	Agriculture	Industry	Services
2012	10402.6	49421.1	5341.6	219.9	478.0	1123.7	47.30	306.96	4.75
2013	10772.5	2456.1	3797.8	627.2	257.9	136.7	17.17	10.11	27.78
2014	13070.0	3303.6	6469.0	806.5	669.5	997.5	16.20	7.52	6.48
2015	8100.0	2330.5	6430.7	359.6	902.5	4585.4	22.5	4.80	1.40
2016	7765.2	2803.1	6760.9	311.7	1709.6	4596.8	24.91	2.24	1.47
2017	6521.8	3004.9	6996.4	751.6	4944.6	1785.0	8.67	0.79	3.91
2018	7491.9	2766.6	8663.7	656.0	4258.4	909.5	11.42	4.02	9.52
2019	10331.8	3432.2	9219.5	119.2	2943.2	290.7	86.67	1.49	31.71
2020	12850.6	2579.7	11108.1	80.8	2285.3	305.3	159.04	23.47	36.38
2021	9944.6	4297.8	12680.5	134.9	248.2	480.8	73.71	29.88	26.37
Average Period							46.759	39.128	14.977

Source; The researcher, based on:
Column (1) Ministry of Planning, Department of Economic and Financial Policies, Iraqi Economic Report, various years.
Column (2) Data from Table (4).
Column (3) The researcher.
The productivity of each sector was calculated according to the following formula: Private GDP of the sector / Private Fixed Capital Stock of the sector.

Table (7) Growth Rate of Private Fixed Capital Productivity across the Economic Sector in Iraq 2012-2021

Year	Agriculture	Industry	Services
2012	-	-	-
2013	-63.6	-96.7	484.8
2014	-5.64	-25.6	-76.6
2015	38.8	-36.1	-78.3
2016	10.7	-53.3	5
2017	-65.1	-64.7	165.9
2018	31.7	408.8	143.4
2019	658.9	-62.9	233.0
2020	83.5	1475.1	14.7
2021	-53.6	27.3	-27.5

Source; The researcher based on data from Table (6).

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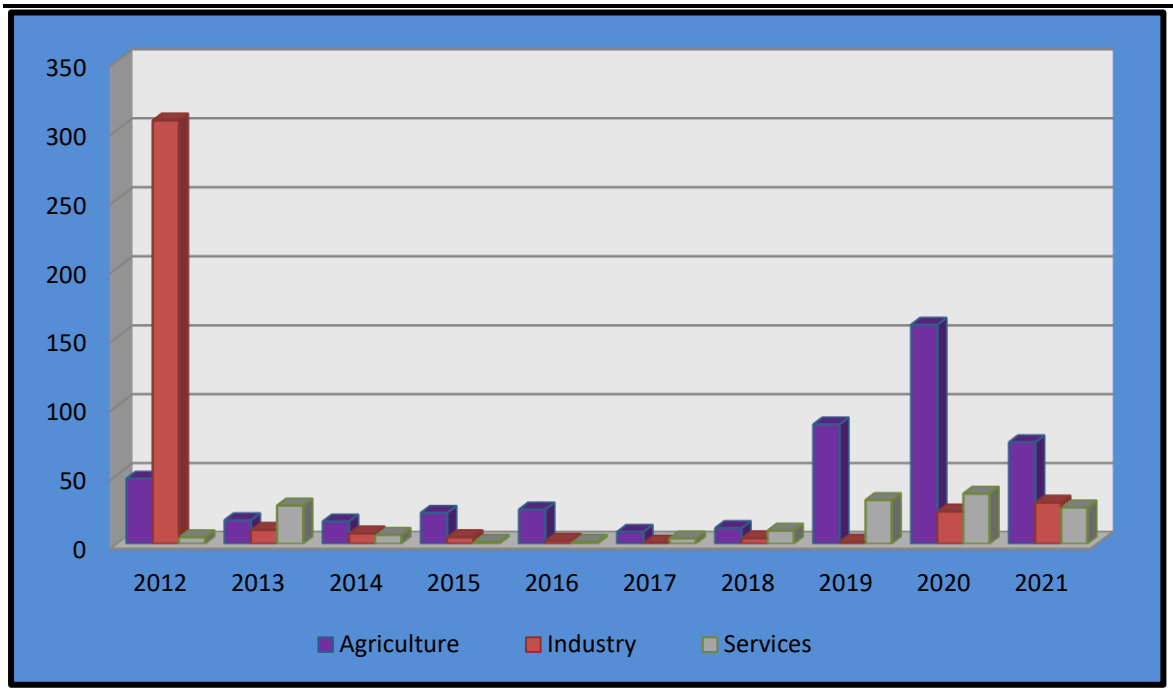

Figure (4) Private fixed capital productivity across major economic sectors 2012-2021

Source; The researcher based on Table (6).

Conclusion

1. The decline in private sector investments compared to the dominance of the public sector is due to the weak financial position of investors, weak financing and lending from the banking system, and the unstable security situation, which have contributed to the marginalization of the private sector in Iraq.
2. The stock of private fixed capital is considered an important variable in constructing economic models due to its direct relationship with the volume of production.
3. The stock of private fixed capital across the Iraqi economy average is (21,888.65) billion dinars, and productivity average is (4.509) billion dinars during the research period.
4. The industrial sector recorded the highest value of private fixed capital stock, with an average value of (1,869.72) billion dinars, followed by the services sector with a value of (1,521.14) billion dinars. The agricultural sector, however, had the lowest value of private fixed capital stock, with a value of (406.74) billion dinars during the research period.
5. The average productivity of the agricultural sector is (46.759)billion dinars, followed by the industrial sector with(39.128) billion dinars, and then the services sector with (14.977) billion dinars during the research period.

Recommendations

1. Encouraging the private sector to invest in economic sectors to develop the gross private fixed capital formation for the purpose of increasing production by providing an appropriate legal and legislative environment and protecting and guaranteeing the rights of investors.

2. Providing all means to promote the private sector, whether through the investment environment or the investment climate, and address all obstacles that hindr it.
3. Adopting economic policies to encourage the private sector to play its role in economic activity by providing the necessary capital to undertake productive investment projects through granting tax exemptions and concessions, as well as reducing interest rates to facilitate access to necessary loans.
4. Following sound scientific planning that ensures the most efficient use of private fixed capital and avoids waste and extravagance in investment resources.

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