Economic Feasibility Study for Establishing a Fleet of Crude Oil Tankers in Iraq

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Abstract:

  Crude oil, refined petroleum products, and gas are considered the most important and prominent in terms of value and quantity in maritime transport, as multiple types of crude oil, petroleum and chemical products are transported on board tankers that were specially designed for this purpose. Tanker markets have witnessed several developments in this field, so It has become necessary for oil-producing and exporting countries to keep pace with it in order to be able to penetrate and remain stable in global oil transport markets. In light of this, Iraq still does not own any crude oil tanker, as it sells its crude oil according to the maritime sales contract (FOB), that is, on the back of the buyer's tanker, and therefore it depends Fleets of foreign companies must transport their oil exports to buyers' ports, and because Iraq is the second largest oil producer among the OPEC countries, it is better for it to have an integrated fleet of crude oil tankers to be a strong competitor in the global oil transportation markets, So The research attempts to prove the hypothesis (the necessity of Iraq owning crude oil tankers in parallel with the developments taking place in global fleets and enhancing its position in the international maritime transport market, in addition to the fact that building a national fleet generates extremely important revenues and has economic feasibility. the research aims to the Statement development of seaborne Iraqi crude oil trade & know the geographical distribution of Iraqi crude oil trade, explaining the method of selling Iraqi crude oil, statement of the economic feasibility of building a crude oil tanker.

Keywords: (crude oil tankers, maritime transport of crude oil, oil exports, Iraqi Oil Tanker Company, CIF, FOB, economic feasibility study).

1-   The introduction:

Maritime transport of oil receives great attention at the level of the Arabic and international economy, given its vital and influential role in the movement of oil supplies, petroleum products and natural gas from the ports of exporting countries to the ports of importing countries in various parts of the world. It is known that more than two-thirds of global oil supplies are transported daily. Through giant and large tankers that begin their journey from export ports in producing and exporting countries to importing countries, while Iraq still suffers from transporting its oil by a national fleet and its lack of oil tankers

makes it far from the global oil transport market in addition to depriving it of the large revenues that can be obtained from it. If he owned a fleet of tankers and transported his oil to the ports of the purchasing countries, So the importance of the research is highlighted by the importance that Iraq has as a producer and exporter of oil in the world, as well as the importance of Iraq owning oil tankers and entering into the field of maritime transportation of crude oil.

2-   The development of seaborne Iraqi crude oil trade:

Oil maritime transport in Iraq is the backbone of its oil trade with various countries of the world, as it relies entirely on the oil ports in southern Iraq for its oil exports. Iraq's seaborne oil trade has witnessed important developments through an increase in the exported quantities of crude oil as a result of industry developments of Oil exports in Iraq after 2003, due to the expansion of the volume of foreign investments in this industry, which included licensing rounds, which led to a noticeable increase in the production and export of Iraqi crude oil. Oil exports are also considered an income flow element, and are also a reflection of the production capacity of oil produced locally, as well as It performs several roles, including (obtaining hard currencies, increasing national income, bringing in foreign capital, covering imports, reducing the burden of external debt... and others), and the export sector is the most prominent sector of the Iraqi economy, and depends primarily on the export of crude oil and oil derivatives. Oil exports are affected by factors including (economic and political fluctuations, global market conditions, development of oil production, OPEC decisions, tanker pipeline capacities, export capacity of oil ports and floating platforms), and thus the growth rate of oil exports is linked to these factors, so any activation Or disruption of oil exports will certainly reflect positively or negatively on the economic growth process in Iraq.

 In general, the development of Iraqi crude oil exports during the period (2004-2022) and its percentage of Iraqi oil production, as well as its percentage of the exports of oil-producing and exporting countries in OPEC and the world, can be observed through Graph (1).These exports grew during the aforementioned period at a growth rate. A compound annual rate of (4.4%), and the annual change rates recorded positive percentages, except for the years (2005, 2010, 2013, 2017, and 2020), as the rate of exports decreased in 2005 compared to the year 2004, when the percentage of change reached (-8.6). %) As a result of the decline in Iraqi oil production rates, the rate of exports was recorded a significant increase of approximately (100) thousand barrels to reach (1,505) million barrels per day in 2006, and the annual change rate reached (7.1%) compared to the previous year, and the percentage of Iraqi oil exports reached (6.3%) and (3,7%) respectively of the total exports of OPEC countries and the world during the same year.

Then it increased again during the years (2007, 2008, and 2009), reaching (1,643), (1,850), and (1,900) million barrels per day, respectively, and the annual change rates were recorded at (9.2%), (12.6%), and (2.7%) respectively, during the aforementioned period, while these exports achieved successive increases of (6.7%), (7.6%), and (8.5%) of the total exports of OPEC countries, respectively, and by (4%), (4.6%), and (5%) of the world's total oil exports, respectively. This is due to the noticeable increase in production rates, as well as the result of the new increase in the repair of oil-carrying pipelines and pumping stations that broke down after 2003, in addition to Regarding the rise in oil prices, especially in 2008, when it reached $97.27 per barrel (OPEC, 2012), and in 2010, the rate of exports decreased by about (10) thousand barrels, achieving an annual change rate of (-0.5%) compared to The previous year, due to the global economic recession and the severe decline in oil prices, as the average price of a barrel reached $78.82 per barrel (OPEC, 2012).

The relatively good recovery that occurred in advanced economies was reflected in the adoption of fiscal stimulus policies, which were partly responsible for the improvement of conditions in those economies during the second half of the year (2009) and the first half of the year (2010), in addition to the rise in crude oil prices by about (26%). The price of a barrel reached around (105) dollars during the years (2011, 2012, and 2013) as a result of the growth in demand for oil (OBEC, 2015), in response to the increase in Iraqi crude oil exports, which reached (2,166), (2,423), and (2,390) million barrels. daily,

respectively, achieving a positive annual change rate during the years 2011 and 2012 that amounted to (19.9%) and (6.9%), except for the year 2013, when the annual change rate reached (-1.3%) over the previous year, while it increased The proportion of these exports reached (9.7%), (9.7%), and (10.1%), respectively, of the total exports of OPEC countries, and it also rose to (5.8%), (5.8%), and (5.9% respectively of the total oil exports in the world during the aforementioned years, due to the increase in oil production by the limit of (300) thousand barrels per day, in addition to the increase in export capacities of Iraqi crude oil in Iraqi oil ports after the entry of the first two floating platforms for exporting crude oil in 2012.

Despite the terrorist organization (ISIS) attack on Iraq and its control over certain places in 2014, Iraqi oil exports continued to rise at a rate exceeding (3) million barrels per day in 2015, as the exported quantities reached (3,004) million barrels per day. An annual change rate of (19.4%) over the previous year, as a reflection of the increase in production rates. The export rate reached its peak in 2019, reaching more than (3.4) million barrels per day, thus achieving an annual change rate of (2%) from the previous year, and the percentage of these exports reached (15.2%) and (7.6%) of the total exports of OPEC and the world, respectively, during the same year, and in 2020 after the price war between Russia And Saudi Arabia, which led to the flooding of the oil market with cheap oil, and this was accompanied by the outbreak of the Corona pandemic (COVID-19), which paralyzed the global economy.

 This led to a decline in oil prices to low levels, as the average price of a barrel reached $40.86 per barrel (OPEC, 2023), which negatively affected the prices and quantities of exported oil, in addition to the fact that OPEC and outside countries reached unprecedented agreements to reduce production, and then this was reflected in Iraqi oil exports as they decreased to (2,905) million barrels per day, but after the improvement that occurred In the growth of global domestic product, which was driven by the return of recovery in economic activities as a result of easing urban procedures after the increase in the vaccination rate and the improvement in global supply chains, oil exports increased by the range of (115) and (291) thousand barrels per day, achieving an annual change rate of (4%). (9.6%), respectively. The percentage of these exports reached (15.4%) and (15.5%), respectively, of the total exports of OPEC countries, while they amounted to (7.4%) and (7.6%). %), respectively, of the world's total oil exports during the years 2021 and 2022, which is the highest percentage recorded during the research period.

Graph (1): Historical development of Iraqi exports to period (2004-2022) (1000 pbd):

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
■ Iraqi oil exports	1,538	1,405	1,505	1,643	1,850	1,900	1,890	2,266	2,423	2,390	2,516	3,004	3,311	3,309	3,345	3,411	2,905	3,020	3,311
■ Opec Oil Exports	22,90	23,69	23,86	24,35	24,19	22,31	23,11	23,45	25,07	23,64	22,64	23,43	25,01	24,65	24,67	22,47	19,70	19,65	21,38
■ The world Oil Exports	39,92	40,54	40,63	40,83	40,11	38,09	38,15	38,85	41,89	40,79	40,08	41,55	44,24	44,83	45,81	44,90	41,70	40,79	43,47
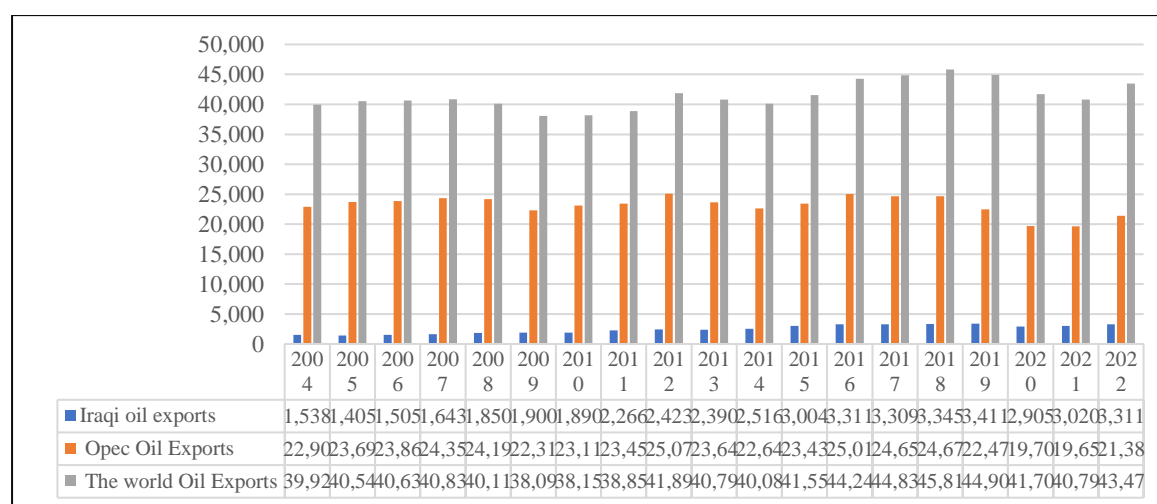
 Source: by author based on:

- Organization of the Petroleum Exporting Countries (OPEC), 2008 &2012 &2015 &2019 &2023, Annual Statistical Bulletin, Vienna, Austria: https://www.opec.org.
- Oil Marketing Company, Crude Oil and Petroleum Products Shipping Authority, Crude Oil Shipping Section, 2024: https://somooil.gov.iq.

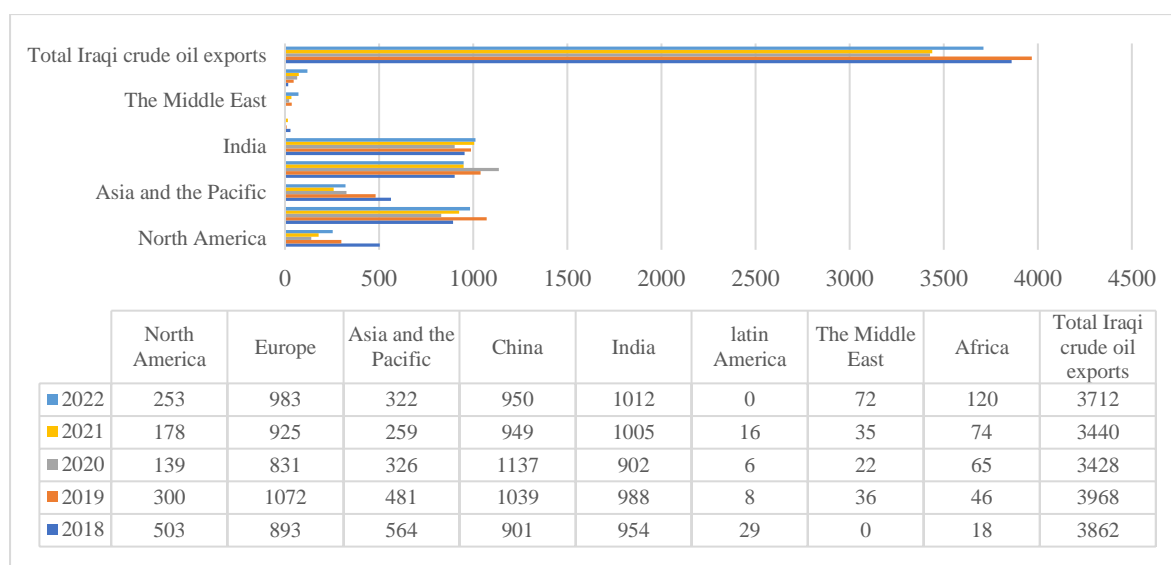**3-   Geographical distribution of crude oil exports:**

The geographical distribution index of exports in general is an important guide to expressing the extent of the national economy's connection with the economies of various countries of the world. This index is based on a basic consideration, which is the necessity of diversifying the country's export markets to reduce potential risks in periods of economic and political crises, while emphasizing that political crises are more dangerous. One of the economic crises is that the latter no longer affect one country alone, but rather have become comprehensive for the entire world, while political crises may occur here and there. Thus, diversity is required in both importing and exporting markets, as the more exports are concentrated with limited countries, the higher the risk of exposure to fluctuations in circumstances. These countries, so we find that Iraq, through the Oil Marketing Company (SOMO), which is responsible for selling and exporting crude oil and petroleum products, is seeking to market its exports to several markets.

From Graph (2), it is clear that the largest portion of crude oil exports in terms of destination during the years (2018-2022) were concentrated in the regions of India, Europe, and China, respectively, as it is noted that the proportion of Iraqi crude oil exports to these regions has increased from (14.7%, (23.1%), and (23.3%), respectively, in 2018, to (27.3%), (25.6%), and (26.5%), respectively, in 2018. 2022, and those exports to each of the regions in the Middle East and Africa increased by modest percentages during the aforementioned period, while the proportion of those exports to the rest of the regions in Asia and the Pacific, North America, and Latin America decreased from (14.6%) (13%) and (0, 75%, respectively, in 2018, to (7.4%), (6.8%), and (0%), respectively, in 2022.

From the above, we find that there is an increase in the relative importance of Iraqi crude oil exports significantly in each of the countries of Europe, India and China, and a slight increase in the countries of the Middle East and Africa, due to the growth occurring in the economies of those countries, especially India and China, while it decreased in the countries of Asia. The Pacific Ocean and the Americas, and this is due to the shift in demand from these regions to destinations other than Iraq, as well as the increase in shale oil production in the United States of America, which reduced its imports of Iraqi oil.

It can also be said that this diversity in export destinations for Iraqi crude oil is considered a diversity of shipping lines through which oil is transported by oil tankers of different sizes and according to the distance between the Iraqi oil exporting ports and the ports of the importing countries.

Graph (2): Geographical distribution of Iraqi crude oil exports to (2018-2022) (1000 pbd):

	North America	Europe	Asia and the Pacific	China	India	latin America	The Middle East	Africa	Total Iraqi crude oil exports
2022	253	983	322	950	1012	0	72	120	3712
2021	178	925	259	949	1005	16	35	74	3440
2020	139	831	326	1137	902	6	22	65	3428
2019	300	1072	481	1039	988	8	36	46	3968
2018	503	893	564	901	954	29	0	18	3862

Source: By author based on: Organization of the Petroleum Exporting Countries (OPEC), 2023, Annual Statistical Bulletin, Vienna, Austria: https://www.opec.org.

4-   How to sell Iraqi crude oil:

In accordance with the applicable laws and instructions, the Iraqi Oil Marketing Company (SOMO) is the only body officially authorized, in accordance with its bylaws, to market the available quantities of Iraqi crude oil and petroleum products from Iraqi refineries in excess of local consumption to global markets at the best possible prices, in a way that contributes to maximizing financial resources. arising from oil exports. It also imports all the petroleum products the local market needs at the lowest possible prices (Oil Marketing Company, 2024). The Iraqi Oil Marketing Company (SOMO) also imports petroleum products in accordance with the Maritime Sales Contract (CIF), i.e. Continue to the Iraqi oil ports while selling Iraqi crude oil according to the contract (FOB), i.e. minus the export port, and according to the equation below (Oil Marketing Company, 2024):

$\{(S) = (M) \text{ (variable)} \pm (F) \text{ (fixed for loading month only)} \pm (H) \text{ (variable per shipment)} \pm (N) \text{ (variable)}\}$.

Since:

(S) = Net price of Iraqi crude oil.

(M) = Average price of signal oil (according to international price bulletins for each market).

(F) = monthly price differences determined by the relevant pricing committee.

(h) = API Gravity of the actual shipment differs from the contractual specifications.

(N) = a percentage of the freight rate, insurance and risks to deliver it to the relevant market (according to global daily bulletins), for the European and American markets only due to the presence of signaling oils in those regions.

From the above, the researcher believes that Iraq pays the fees for renting oil tankers and insurance for shipments in the case of importing petroleum products according to the contract (CIF), while it loses the opportunity to benefit from these revenues in the case of selling crude oil and petroleum products according to the contract (FOB), and it also offers price discounts As compensation for transportation fees to the European and American markets, since it does not have a naval fleet to transport crude oil, and there are many reasons that led to Iraq relying on the basis of contract (FOB), the most important of which is the destruction that occurred to its naval oil fleet during the war in 1991, and its inability to rebuild a new fleet. Because of the economic and political circumstances he experienced.
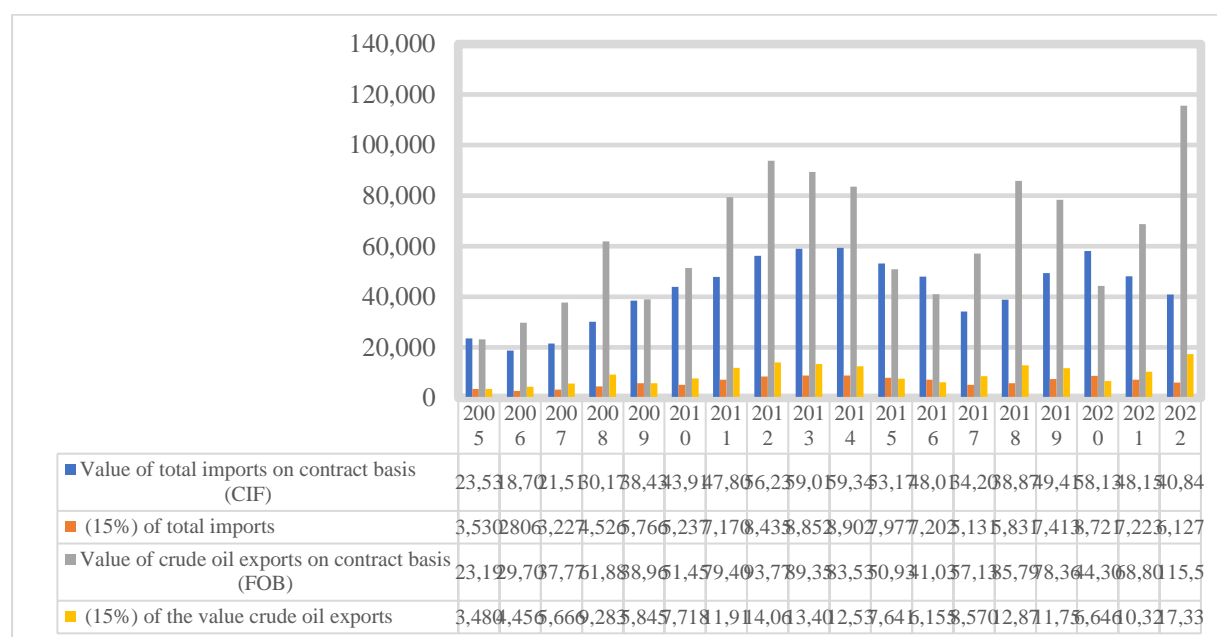
The amount of money lost to Iraq as a result of not having a fleet of oil tankers can be seen by looking at Table (3), which shows the values of Iraq's total imports calculated on the basis of the contract (CIF), the amounts of payments for import services, and the values of oil exports calculated on the basis of the contract (FOB). And the amounts lost as a result of following this trade policy during the period (2005-2022), as it is noted that the values of total imports increased from (23,532) billion dollars in 2005, to reach (40,848) billion dollars, achieving a compound annual growth rate of (3.31 %), as a result of freedom from restrictions imposed on Iraq's foreign trade, in addition to the Iraqi markets' need for consumer goods that were deprived of them due to the economic blockade, as well as its need for petroleum products required in the transportation sector due to the increase in the number of cars in Iraq, due to the inability of local production to cover the demand. The largest supply of goods and services required by Iraqi society.

Since Iraq imports on a contractual basis (CIF), it is one of the countries receiving foreign services, as it bears large amounts of foreign currency in exchange for transportation, shipping, and insurance services, which are added to the total value of imports as payments for these services, as they constitute a percentage (15%) of the value of imports (Central Bank of Iraq, 2022), which amounted to (3,530) billion dollars in 2005, and increased in conjunction with the increase in the volume of imports to reach (6,127) billion dollars in 2022. It can also be noted that oil exports are concentrated by (75%) of Total exports in 2022, and they took a growing trend during the period (2005-2022) and were calculated on the basis of

contract (FOB), as they increased from (23,579) billion dollars in 2005, to reach (120,572) billion dollars in 2022, At a compound annual growth rate of (9.94%).

According to this policy, most of the crude oil is transported via sea to the buyers' ports. As the value of these exports increases, the value of the lost amounts increases, which can be counted as receipts for export services at a rate of (15%) of the total value of oil exports, which includes services (transportation, shipping, and insurance). If the export policy was followed according to the contract basis (CIF), the researcher estimated it at (3,537) billion dollars in 2005, increasing to reach (18,086) billion dollars in 2022, and this percentage is linked to a direct relationship with the value of exports, as is the case with the value of imports also increases as they increase and decreases as they decrease.

Graph (3): The value of total imports and oil exports and a percentage (15%) of transportation, shipping and insurance services for the period (2005-2022) (million dollars).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
■ Value of total imports on contract basis (CIF)	23,53	18,70	21,5	30,17	38,43	43,9	47,86	56,25	59,05	59,34	53,17	48,06	34,20	38,87	49,45	58,13	48,15	40,84
■ (15%) of total imports	3,530	2806	3,227	4,526	5,766	6,237	7,170	8,435	8,853	8,902	7,977	7,205	5,131	5,837	7,413	8,727	7,223	6,127
■ Value of crude oil exports on contract basis (FOB)	23,12	29,70	37,75	61,88	38,96	51,45	79,40	93,78	89,33	83,55	50,93	41,03	57,13	85,79	78,36	44,36	68,80	115,5
■ (15%) of the value crude oil exports	3,480	4,456	6,660	9,285	5,845	7,718	11,91	14,06	13,40	12,53	7,640	6,155	8,570	12,87	11,75	6,646	10,32	17,33

Source: By author based on:

- Central Bank of Iraq, Annual Statistical Bulletins for the Years (2005-2021): https://cbi.iq.
- Oil Marketing Company (SOMO), 2024, value of crude oil exports in 2022: https://somooil.gov.iq.

The author believes that the policy of contracting on the basis of (FOB) in the sale of Iraqi crude oil has negative effects in not developing the marine fleet to transport oil in Iraq, in addition to its effects on national insurance companies, and the loss of the opportunity to exploit this main resource.

The country can obtain large sums of money that can be exploited and invested in building an efficient and diversified fleet that works to integrate Iraqi oil policy.

5-   Economic feasibility study for building a VLCC crude oil tanker:

A-   Project idea: Building a very large crude oil tanker (VLCC).
B-   Project description: Transporting Iraqi crude oil on the basis of delivering shipments to the buyer's port using the (CIF) Insurance & Fright Cost method. This means that the process of transporting oil according to this method includes shipping fees, insurance, and transportation costs.
C-   Project goals:
-          Transporting Iraqi crude oil.

-            Enabling Iraq to compete and access global transportation markets.
-            Providing new job opportunities.
-            Achieving significant financial revenues.
-            Imposing Iraq's sovereignty in the ports of countries importing Iraqi crude oil.

D-   **Project location**: Basra Governorate.

E-   **Duration of establishing the project:** (1.5-2) years.

F-   **Project capital:**

-            The cost of building a VLCC crude oil tanker in Japanese and Korean ship yards is approximately $130,000,000 (ATHENIAN SHIPBROKERS S.A, 2024).

-            The rate of tanker demolation is 7% annually (Federal Financial Supervision Office, 2012).

-            Establishment expenses ($250,000) include (expenses for sending follow-up committees to the construction yard and tanker registration expenses (Iraqi Oil Tankers Company, 2024).

G-   **Project implications**: include:

-            The tanker's crew is 25 people.
-            The tanker's design load is (320) thousand tons.

H-   **Project outputs**: include the following:

-            Crude oil transportation.
-            Loading rate: 280 thousand tons (2 million barrels).
-            The fee for transporting one ton of crude oil: ($24.99) (Iraqi Oil Tankers Company, 2024).
-            Route: from Basra Oil Port to Chinwangtao Port in China.
-            Ship speed: 13 knots.
-            Trip duration: 44 days, round trip (Port To Port ,2024, https://sea-distances.org)
-            Operation period: (308) days, (7) trips annually.

I-   **Project operational costs**: include:

-            **Variable costs**: These include consumed fuel, water, and oils, as shown in Table (1).

Table (1): Variable costs:

No:	Details	Cost/day	Cost / 308 day
1	Fuel consumed (100 tons/day * $598 VLSFO) during the operating period (308) days	59800dollar	18418400
2	Fuel consumed (10 tons/day * $598 VLSFO) during downtime (52) days	5980dollar	310960
3	Water and oils ($/year)	750dollar	270000
4	Revenues and wages from Iraqi ports ($/ton) (Tanker tonnage * Number of trips * Port revenues and fees)	1,8dollar each ton	3780000
Total amount			**22779360**

Source:

-            Clarksons Reserch (2023), Shipping Review & Outlook, Annual Report, September 2023.

-            Iraqi Oil Tanker Company (2024), Operating costs, Technical Section: https://iotc.oil.gov.iq.

-            The General Company of Iraqi Ports (2022), tariffs and fees for Iraqi ports: https://www.scp.gov.iq.

- **Fixed costs**: These include the salaries of the tanker crew, insurance, maintenance, dry dock, and other expenses as shown in Tables (2 and 3).

Table (2): Fixed operating costs:

Details	Cost day /dollar	Cost year/dollar
Chemicals	125	45000
Equipment and stores	410	14600
Repair, maintenance, inspector and dry dock	1800	648000
Insurance expenses for the hull, engines and protection club	1200	432000
spare parts	430	154800
General expenses	420	151200
Total amount	**4385**	**1578600**

Source: Iraqi Oil Tankers Company, 2024, Operating costs, Technical Section: https://iotc.oil.gov.iq.

able (3): Tanker crew salaries:

Total annual salary	Monthly salary	No.	Rank
192000	16000	1	Captin
156000	13000	1	Chief officer
96000	8000	1	2officer
72000	6000	1	3 officer
60000	5000	1	4 officer
180000	15000	1	Chief engineer
156000	13000	1	First engineer
96000	8000	1	Second engineer
72000	6000	1	Third
60000	5000	1	Forth
72000	6000	1	Electric engineer
21600	1800	1	Boss man
62400	5200	4	(GP) Sea men
21600	1800	1	Moter man
12000	1000	1	Moter man
43200	3600	3	Sea men (Moter men)
18000	1500	1	Mechanical
18000	1500	1	Coker

	14400	1200	1	Stewr
	9600	800	1	GP
Total amount	**1432800**	**$119400**	**25**	

Source: Iraqi Oil Tankers Company, 2024, Salary of Crew, Commercial Section: https://iotc.oil.gov.iq.

J-   **Project revenue:**

Work period: (308) days, including (7) trips

Actual tanker load: (300) thousand tons

Annual revenue = tanker load * transportation fee per ton * number of trips

Total revenue = 300,000 * 24.99 * 7 = 52,479,000 dollars

Total costs = total annual fixed costs + total annual variable costs

= 3011400 + 22779360 = 25790760 dollars

Net profit = total revenue - total costs

= 52,479,000 – 25,790,760 = $26,688,240

K-   **Criteria for economic evaluation of the project:**

-                 **Undiscounted commercial profitability standards:** These are standards that ignore the temporal change in the value of money. The most important of these standards are:

-                 **Average rate of return on investment (accounting standard**): It can be found using the following methods:

The first method: The average rate of return is calculated without taking into account tax, depreciation, and the scrap value of the project, as follows:

$$\text{Average return on investment} = \frac{\text{Average rate of return}}{\text{Investment cost}} \times 100$$

$$\text{Average rate of return} = \frac{26688240}{130250000} \times 100$$

ARR = 20.5%.

The second method: This method takes into account depreciation, tax, and scrap value (if any), and the average rate of return is determined according to the following method:

$$ARR = \frac{\text{Average annual net return}}{\text{Average cost of investment}} \times 100$$

Given the lack of knowledge of the scrap value of the project at the end of its life (the oil products tanker), as well as the absence of taxes because the Iraqi Oil Tanker Company is a public company owned by the state, finding the average rate of return becomes as follows:

$$ARR = \frac{26688240 - 9100000}{130250000\ /2} = \frac{17588240}{65125000} = 27\%.$$

Since the average rate of return on investment is greater than the prevailing interest rate in the market, the project is profitable and economically acceptable.

- **Standard recovery period:**

This criterion expresses the period necessary to recover the initial investment in a specific project through the net cash flows that the project achieves during its productive life. The shorter the period of capital recovery, the more this is in the interest of the economic project in terms of acceptance. The best projects are the ones that recover the invested amount. In the shortest possible period of time, this criterion can be obtained through the following formula:

$$\text{Payback period (PP)} = \frac{\text{Initial investment}}{\text{Net cash flow}} = \frac{130250000}{26688240} = 4.9 \text{ years.}$$

That is, the Iraqi Oil Tanker Company can recover the investment cost of the VLCC tanker purchase project within (four years and nine months).

L- **Discounted economic profitability indicators**: These are standards that take into account the temporal change of money. The most important of these standards are:

- **Net present value criterion:** This criterion can be found according to the following formula:

Net present value = total present value of net cash flows - investment

Total present value = $cf \times (1+v)^n$

So: cf = cash flow, v = discount rate, n = number of periods.

And the discount rate = $\dfrac{1}{(1+r)^n}$

So (r) = the estimated discount rate with the prevailing market interest rate.

Assuming that the prevailing interest rate in the market for loans is (12%), and the useful life of the project is (15) years, it is possible to find the discount rate and then find the net present value according to the table method as follows:

The discount rate for the first year = $\dfrac{1}{(1+0,12)^1}$ = 0.893.

And so on for the rest of the years of the project's life.

Table (4): discount of the cash flows and the costs:

Present value of returns	Total returns of the project	Present value of costs	Discount rate	Total costs	Investment $costs	Project age/year
45970747	52479000	23031149	0,893	25790760	1302500000	1
41825763	52479000	20555236	0,797	25790760		2
37365048	52479000	18363021	0,712	25790760		3
33324165	52479000	16377133	0,635	25790760		4
29808072	52479000	14649152	0,568	25790760		5
26606853	52479000	13075915	0,507	25790760		6
23720508	52479000	11657424	0,452	25790760		7
21201516	52479000	10419467	0,404	25790760		8
19994499	52479000	9826280	0,381	25790760		9
16898238	52479000	8304625	0,322	25790760		10
15061473	52479000	7401948	0,287	25790760		11
13487103	52479000	6628225	0,257	25790760		12
12017691	52479000	5906084	0,229	25790760		13
10758195	52479000	5287106	0,205	25790760		14
9603657	52479000	4719710	0,183	25790760		15
357643528		**176202475**	**The total present value of cash flows**			
181441053			**The present value of the net cash flows over the life of the project**			

Source: Calculated by author.

NPV = 181441053 – 130250000 = 51191053

The project is economically feasible because the net present value is positive.

$$\text{Or NPV} = \frac{\text{Present value of cash flow}}{\text{Present value of costs}} = \frac{357643528}{176202475} = 2$$

The project is economically feasible because the net present value is greater than one.

- **Internal rate of return standard:**

To find the internal rate of return requires using a trial and error method, where discount rates are assumed, the net present value is calculated, and the process is repeated until the discount rate is reached that makes the net present value equal to zero:

$$\text{Internal rate of return} = F1 + \frac{(F2 – F1)\,(QV1)}{}$$

$$QV1 – QV2$$

Since:

F1 = minimum discount rate.

F2 = maximum discount rate.

QV1 = Net present value at the minimum discount rate.

QV2 = Net present value at the higher discount rate

For the purpose of finding the internal rate of return, we must find the current value of the dollar at assumed discount rates, from which we find the discount rate that makes the discounted value equal to the initial investment, as in Tables (5 and 6).

Table (5): The present value of one dollar at assumed discount rates:

%20	%19	%18	%17	Year
1	1	1	1	**Before operation**
0,833	0,840	0,847	0,855	**1**
0,694	0,706	0,718	0,731	**2**
0,579	0,593	0,609	0,624	**3**
0,482	0,500	0,516	0,534	**4**
0,402	0,419	0,437	0,456	**5**
0,335	0,352	0,370	0,390	**6**
0,279	0,296	0,314	0,333	**7**
0,233	0,249	0,266	0,285	**8**
0,194	0,209	0,225	0,243	**9**
0,161	0,176	0,191	0,208	**10**
0,135	0,148	0,162	0,178	**11**
0,112	0,124	0,137	0,152	**12**
0,093	0,104	0,116	0,130	**13**
0,078	0,088	0,099	0,111	**14**
0,065	0,074	0,084	0,095	**15**

Source: Estimated by author.

Table (6): The present value of net cash flows at assumed discount rates:

%20	%19	%18	%17	Net cash flow	Year
22231304	22418122	22604939	22818445	21925800	**1**
18521639	18841897	19162156	19509103	21925800	**2**
15452491	15826126	16253138	16653462	21925800	**3**
12863732	13344120	13771132	14251520	21925800	**4**
10728672	11182373	11662761	12169837	21925800	**5**

8940560	9394260	9874649	10408414	21925800	**6**
7446019	7899719	8380107	8887184	21925800	**7**
6218360	6645372	7099072	7606148	21925800	**8**
5177519	5577842	6004854	6485242	21925800	**9**
4296807	4697130	5097454	5551154	21925800	**10**
3602912	3949860	4323495	4750507	21925800	**11**
2989083	3309342	3656289	4056612	21925800	**12**
2482006	2775577	3095836	3469471	21925800	**13**
2081683	2348565	2642136	2962395	21925800	**14**
1734736	1974930	2241812	2535383	21925800	**15**
124767523	**130185235**	**135869830**	**142114877**	**Total net present value**	
130250000	**130250000**	**130250000**	**130250000**	**Initial investment**	
-5482477	**-64765**	**5619830**	**11864877**	**Net present value**	

Source: Calculated by author.

From the table above it is clear that the minimum discount rate of (18%) and the highest discount rate of (19%) is when the total net present value of cash flows during the project's lifespan approaches the value of the initial investment, that is, it approaches zero, and to find the internal rate of return We apply the previous equation and as follows:

$$\text{Internal Rate of Return} = 0.18 + \frac{(0.19 - 0.18)(5619830)}{5619830 - (64765\ -)} = 0.18 + \frac{(5619830)(0.01)}{5684595}$$

$$\text{IRR} = 0.18 + \frac{56198}{5684595} = 19\%$$

Since the internal rate of return is greater than the prevailing market interest rate, the project is economically acceptable.

Conclusion:

From the above, it is clear that there is great economic feasibility in owning crude oil tankers to transport Iraqi crude oil to buyer ports around the world, as the feasibility criteria have proven the economic acceptance of the project, because Iraq is one of the largest producers and exporters of oil in the world, and therefore owning a fleet of oil tankers will be fully operated to provide oil shipments in Iraq. In addition, owning oil tankers will lead Iraq to sell its oil according to the maritime sales contract (CIF). This process has great positive effects on the Iraqi economy because selling according to this method will lead to obtaining sums of money. In addition to the transportation fees, it will include insurance fees and maritime agency fees and an increase in their activity, as well as the development of Iraqi workers in the maritime field as a result of familiarization with the maritime transport market and the developments occurring

in   it.

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