



# Muhammad-Ali Zainy\* IRAOI ECONOMY BETWEEN **SADDAM HUSSAIN AND THE UN SANCTIONS\*\***

In order to have a feel for and appreciate as to what happened to the Iraqi economy under Saddam Hussain and the sanctions, how bad and how dire the Iraqi economic situation has become, it is necessary that you should be exposed to an overview of the Iraqi economy before the Gulf War and the imposition of economic sanctions. More effectively still, you should be exposed to the Iraqi economic picture before the Iran-Iraq war. Only in that way can you develop a sense of comparison between the Iraqi economic situation now and the one in the not-so-distant past.

# The Iraqi economy until 1980

From the beginning when Iraq started receiving oil revenues in the form of royalties in the 1930s, this income was treated as a budgetary surplus to be used for financing various capital projects. The disposition of these revenues, however, was not subject to conscious planning until 1950. Serious Iraqi economic development planning and investments, to cure the state of underdevelopment of the Iraqi economy, started in the early 1950s when oil revenues became relatively abundant.

Iraq's cumulative oil revenues over the period 1951-80 reached about \$100 billion. Despite the unstable environment which characterised this period, especially before the Ba'thists assumed power, when the economic plans were postponed, terminated, or modified, the successive regimes were able to allocate about \$60 billion of the \$100 billion for the economic development plans. However, due to the limited absorptive capacity of the country for investment capital, only about 60% of the allocations were invested.

#### Golden era

Notwithstanding the shortcomings which remained as characteristics of the economy, it can be said that this period was a golden one as far as the gross domestic product (GDP) and per capita income were concerned (see Table 1 below).



Table 1: Sectoral distribution of Iraqi GDP (1960-80) in constant 1980 prices (\$mn)

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	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	
Agriculture	1408	2112	2474	2122	2374	
Petroleum	6743	8521	10459	14973	30872	
Manufacturing	264	319	486	802	2269	
Other sectors	1727	2905	3632	6428	14557	
Tota1	10142	13857	17051	24325	50072	

Source: Zainy, M.A.

According to Table 1, the GDP increased almost five times in real terms over the period 1960-80, with average annual growth rate of 8.3%. But this growth, as in all Arab oil exporting countries, was skewed. Unlike developed economies, or the "tiger" economies, which depend on an active industrial/trade base, it was mainly driven by the oil sector. During 1960-75, the Iraqi economy grew by an average of only 6% per annum; but during the period 1975-80, the average annual growth rate became 15.5 percent!

The non-oil sector grew by an average of 9% per annum during 1960-80 (of course this was allowed by the expenditures and investment moneys generated mostly in the oil sector). This growth rate was slightly higher than the growth rate of the petroleum sector, which caused the GDP share of the oil sector to drop, but not by much. It only dropped from 66% in 1960 to 62% in 1980. This shows that, after 30 years of economic development planning and investment, the Iraqi economy at its best year (1980) was still characterised by dominance of primary production. If we add agriculture to that, the dominance of primary production becomes even worse.

Agriculture's share in 1960 GDP was 14%. It dropped to 4.7% in 1980. Its annual average real growth rate was only 2.6% over the period 1960-80, even less than the population growth rate, causing a widening food gap and increasing dependence on food imports.

The manufacturing sector's real growth was 11.4% during 1960-80, which was a splendid rate. But it started from a very low base of only 2.6% of the GDP in 1960 and thus ended up with a share of only 4.5% of the GDP in 1980.





This serious deficiency in the agricultural and manufacturing sectors did not show up until the sanctions were imposed because, simply, the oil money used to pay for the imported agricultural products and manufactured goods.

The Iraqi per capita income attained its highest level in 1980 (see Table 2). It can be said with a reasonable amount of fairness that the middle class reached its highest size in 1980 and, therefore, the GDP per capita in that year represented the closest to what can be said about equitable distribution of income in the recent history of Iraq. The per capita income increased (in constant 1980 prices) from \$1,470 in 1960 to \$3,765 in 1980, implying an average annual growth rate of 4.8%, which was one of the highest in the world, given the very high Iraqi population growth rate of around 3.5%. As a result, the Iraqi people were, in 1980, the recipients of one of the highest incomes among the developing countries of that time.

Table 2 Iraqi per capita income (constant 1980 prices)

		1	,	
	Population	GDP	GDP per capita	Annual
				Growth
	(million)	(\$million)	(\$1000)	(%)
1960	6.9	10142	1470	
1965	8.1	13857	1711	3.1
1970	9.4	17051	1814	1.2
1975	11.1	24325	2191	3.9
1980	13.3	50072	3765	11.4

Again, we have to mention here that this high per capita income was mainly a result of the petroleum sector's rapid expansion. During 1960-75, the average annual growth rate of the per capita income was only 2.7%. This rate jumped to 11.4% per year during the 5-year period 1975-80 due, of course, to the oil price explosion and the concomitant high inflow of oil revenues.

As a result of the country's oil revenues explosion, and despite the dramatic expansion in imports, the current account witnessed a rapid annual increase during the second half of the '70s. This high positive current account led to the accumulation of foreign reserves of around \$35 billion by 1980.

#### Saddam Hussain in power

Saddam assumed full power in the summer of 1979. Although the economy at that time was relatively strong, and growing at a fast rate, with the foreign





reserves building up rapidly, the economy at that time had several shortcomings, including:

- 1) The role of the agricultural and manufacturing sectors were very small. Their shares in the GDP of 1980 were only 4.7% and 4.5% respectively.
- 2) The economy was dominated and driven by the oil sector. Its share in the GDP of 1980 was 61%.
- 3) The economy was dependent on imports, especially food and manufactured consumer products.
- 4) The economy was dominated by the inefficient public sector, 75-80% of the GDP.

## The Iran-Iraq War

Against this economic background Saddam started his first war, i.e. the Iran-Iraq War. We can aptly claim that this war was the "mother of all wars" as far as the Iraqi economy is concerned. From the outset, the warring parties tried to strangle each other economically, and the first casualty of this policy was the oil industry.

In September 1980 the War was started, and in the same month the two Iraqi deep-water export terminals in the Gulf, Al-Bakr and Amaya, each with a capacity of 1.6 million bpd, were destroyed. At that time Iraq used to export 3.2 million bpd of which 2.4 million bpd were through Al-Bakr and Amava. This meant that Iraq immediately lost 75% of its export capacity. In April 1982, Syria closed the oil pipeline to the export outlet in the Mediterranean. The only outlet left was the 0.7million bpd pipeline to the Mediterranean through Turkey.

#### Economic losses due to the War

- 1) Around \$60 billion in oil revenues due to reduced export capacity during the first few years of the War.
- 2) \$35 billion depletion of the foreign reserves.
- 3) Accumulation of foreign debt of \$42 billion to non-Arab countries and about \$35 billion to Arab countries.
- 4) Additional military expenditures of \$105 billion.
- 5) Destroyed infrastructure, value \$30 billion.

In addition to the above, there was a slowdown in the Iraqi economy during the War due to many factors among them were:

1) Contraction of the oil sector.





- 2) Termination of expenditures on economic development.
- 3) Contraction of imports of productive raw material and spare parts.
- 4) Contraction of the agricultural and industrial labour force due to military recruitment.

Whereas the Iraqi economy grew by 8.3% during 1960-80 and 11.4% during 1970-80, it should have grown by at least 5% per year during the '80s, in the absence of the War. This assumed growth rate, which is lower than those of the '60s and '70s, is due to taking in consideration the deterioration of the oil market during the '80s (see Table 3).

Instead, the overall GDP declined in real terms during 1980-89 by 1.1% per year. The agricultural sector grew by only 3.2%, annually, a disappointing rate given that Iraq was involved in a long war and revitalising this sector should have been a priority. The manufacturing sector grew by only 2.2%, compared with 11.3% during 1960-80. This slow growth was due to many factors among them: lack of spare parts and raw material inputs, contraction of the labour force because of recruitment to the War,

Table 3 Iraqi GDP over the period 1980-89 (\$million constant 1980 prices)

	<u>1980</u>	1985	1988	1989
Agriculture	2374	3206	2906	3141
Petroleum	30872	14186	29019	24830
Manufacturing	2269	2432	3079	2755
Other sectors	14557	15123	15844	14644
Total	50072	34947	50848	45370

Source: Zainy, M.A.

and lack of investment. The total loss in GDP during the War, according to our estimate, was around \$342 billion. Additionally, there were human losses estimated as follows: 150,000 killed, 500,000 wounded, and 70,000 POWs.

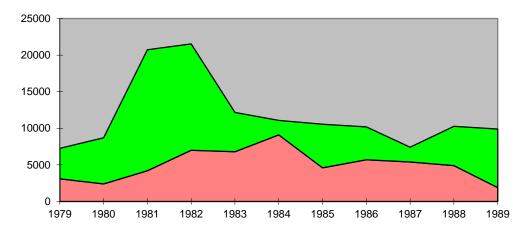
#### Foreign debt legacy

One of the worst legacies of the Iran-Iraq war, which Iraq is still living with and has to address, is the issue of foreign debts. The Iraqi regime, thinking that the War will not last for long, followed for the first few years of the War a "guns and butter" policy to appease the population. Its civilian imports increased tremendously, and so did its military imports throughout the War years (see figure below).





### Iraqi civilian and military imports (1979-89)



As a result of these huge imports, and the payments for invisibles, Iraq sustained negative current accounts in seven out of the eight years of the war. To cover this shortfall, Iraq started borrowing abroad and accumulated an amount of around \$42 billion in foreign (non-Arab) debt at the end of the War. Additionally, Iraq accumulated about \$40 billion in debt owed to Arab countries, which it considers partially as grants and partially as interest-free loans.

#### The Iraqi economy after the Gulf War

Intensive and extensive bombing for 43 days wreaked havoc on the Iraqi economic infrastructure. Electricity, oil export facilities, oil refineries, roads and bridges, railways, airports, industrial plants, etc. were destroyed.

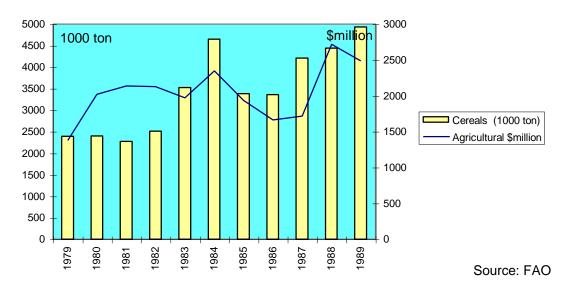
Worse still, SC Resolution 661 was passed on August 6, 1990, imposing economic sanctions on Iraq. The reality of the sectoral distribution of the Iraqi economy in 1989, the year preceding the Gulf War, showed the glaring dominance of the oil sector and the weakness of the other commodities sectors, namely, agriculture and manufacturing. The GDP's share of the oil sector was 55% compared with 62% in 1980. This is not due to an improvement in the performance of the other sectors. It is simply a result of the deterioration of the oil market in the '80s. The sector declined by 2.4% annually during 1980-89, while the growth rate of the agricultural and manufacturing sectors was not enough even to catch up with the population growth rate. This meant that Iraq had to





produce and export oil in order to earn foreign exchange and import food and manufactured consumer products (see figure below for agricultural imports).

#### Cereals and agricultural imports (1979-89)



#### Iraqi Agriculture

The area of Iraq is 438,000 sq. km (170,000 sq. miles). One-fifth of the area covers the alluvial plain, which forms the fertile basin of the two rivers, extending from north of Baghdad to the Arabian Gulf. Two-fifth of the area covers the Western Desert plateau. One-fifth covers the area between the two rivers, to the north of Baghdad (Aljazirah). The last fifth covers the mountainous area North and North-East of Iraq. Rainfall happens in Autumn, Winter, and Spring; 400-1000 mm in the north, and 50-100 mm in the southern plain and the desert plateau. The arable land makes around 21% of the total area and only about 50-70% of the arable land is cultivated.

Agriculture in Iraq has been inefficient since the beginning. Problems stemming from the agricultural reforms, soil salinity, and primitive agricultural practices have plagued this sector. Iraqi agricultural land is very plain. Although the distance between Baghdad and the Gulf is 550 km, Baghdad is only 34 meters above sea level. Although this makes irrigation easy, these plains become easy prey to floods on the one hand and drainage becomes difficult on the other hand.





The Iraqi soil has a high salt content and the silt the rivers bring is also rich in salt. As the water table rises as a result of floods, rain, and irrigation, salt also rises to the surface and is left on the soil after intense evaporation during the long hot summers. This salinity is converting the Iraqi agricultural lands to barren lands. The salt needs to be washed away, and good drainage is badly needed. Efforts in this regard are inadequate.

In performing the agricultural reforms since 1958, the government sequestered the land, which it could not all distribute in time. As a consequence, the government became the biggest landlord in the country, with the farmers getting their land through short-term leases. Feeling insecure as a result of lack of ownership and constant shifts in agricultural policies and land reform legislation, many farmers lost interest in the long-term improvement of the land and turned away from cash cropping towards subsistence farming.

Advanced farming practices are not widespread, and crop rotation remains rare, as there is mostly one crop per year. Also, fallow farming is still used where half of the land is cultivated while the other half is left to accumulate moisture and organic fertilisers. The use of leguminous crops within the cereal rotation is still rare.

#### Impact of the sanctions on production

The economic sanctions have made matters worse. Lack of machinery, spare parts, fertilisers, pesticides, seeds, electricity, and deterioration of the agricultural infrastructure caused agricultural production to dwindle. The numbers from the Food and Agriculture Organisation (FAO) show that per capita agricultural production in Iraq declined by about 32% during (1986-1997) despite the favourable prices given by the government to farmers and the subsidisation of seeds and pesticides.

The manufacturing sector shrank severely as the sanctions starved this sector of raw materials, spare parts, and investment capital. With the drastic decline in the manufacturing sector, the halt in external trade, and the almost complete vanishing of the petroleum sector, the GDP experienced a massive drop (79%) between 1989 and 1993, representing an average decline of 32% per annum during that 4-year period (see Table 4).

Table 4 Sectoral distribution of Iraai GDP during 1989-93 (Smillion 1980 prices)

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1989	1990	1991	1992	1993	

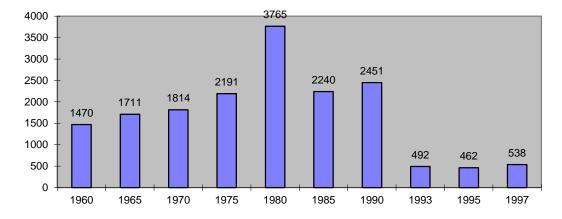


Agriculture	24830	3434	2638	3143	3088
Mining		22838	406	-69	-1798
Manufacturi		2303	1252	1299	1200
ng Others Total GDP	14644 45370	15786 44361	7117 11413	8657 13030	7052 9542

Source: Central Statistical Organisation

**Individual income:** With the drastic decline in GDP and the continuous increase in population, the GDP per capita spiralled downward such that in 1995 it was only 12% of the peak reached in 1980, and the 1997 income dropped to about one-third of that of 1960 (see figure below). The effect of the severe decline in per capita income was made much worse by two other factors: inflation and maldistribution of income.

Iraqi per capita income over the period 1960-97 (constant 1980 prices)



**Inflation:** The Iraqi agricultural sector does not produce more than one third of the agricultural needs of the Iraqi people. The rest is imported. After imposing the sanctions, the Iraqi government reverted to food rationing at nominal prices. Before the sanctions, the Iraqi individual used to get a little over 3,000 calories. According to the rationing system, the food calorific value per individual dropped to 30-50% of the level before the sanctions. Animal protein is absent and, to supplement the food requirements, people needed to buy food outside the rationing system.

Importers used to get their foreign exchange from the government at the official rate of \$3.2 to the Iraqi Dinar. The government stopped providing such foreign

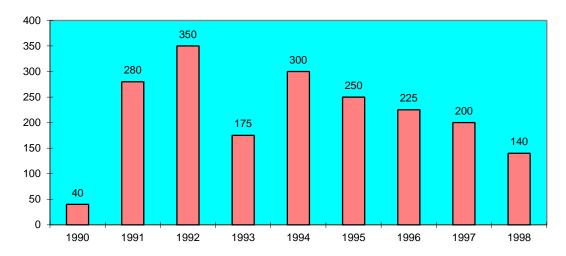




exchange even before the Gulf War, due to the severe shortage of foreign exchange it was experiencing. When importers started buying foreign exchange using Iraqi Dinars, its value started declining. What made matters worse was the government reversion to printing money and also buying foreign exchange using local currency. The Iraqi Dinar collapsed as a result, and the spiralling inflation, which started in the late '80s, became hyperinflation after imposition of the sanctions.

A visiting committee from FAO found that prices of staple foods in mid-1993 compared with prices in mid-1990 (i.e. before the sanctions), increased as follows: flour 355 times, rice 71 times, cooking oil 106 times, and sugar 149 times. The cost of a food basket for six people jumped from ID110 to ID5,400 (49 times) during the same period. The individual income collapsed! (see figure below).

### Trend of consumer prices, % change year on year (1990-98)



**Income distribution:** When we speak of per capita income, being GDP divided by population, the implication of this is that there is 100% equity in income distribution and all the population is middle class. This is never true in any country, and with Iraq the situation has become much worse in the aftermath of the Gulf War and the sanctions, as the middle class has all but disappeared.

The income distribution in the aftermath of the Gulf War, sanctions and hyperinflation has become extremely skewed. A new unique rich society has come into existence - the president and his family, the top Ba'thists and





government officials who are considered as Saddam's henchmen and cronies, smugglers, contractors, merchants and industrialists who are well-connected with the regime. This class makes a small percentage of the Iraqi population. The middle class has become poor. The poorer class has sunk down to, or below, the level of subsistence.

#### **Differential impact**

There has been a differential impact of the war and sanctions on the Iraqi population:

- 1) Excluding the three Kurdish governorates, the south has suffered the most. This is because of poorer infrastructure, more economic damage resulting from the Iran-Iraq war, widespread economic damage and discrimination as a result of the uprising after the Gulf War, and the continued struggle in the south.
- 2) Notwithstanding the few groups who were singled out for favourable treatment, the Shiites in general and the south in particular, have fared worse than the Sunnis in the centre and north of Iraq.
- 3) The group of salaried employees dependent on the government has collapsed into poverty.
- 4) The urban poor have fared worse than the rural poor. This is a result of dependence of the Iraqi urban society on government services such as electricity, water, health services and food distribution, which have become crippled as a result of war and sanctions.

#### Other effects of the sanctions:

1) Due to breakdown in clean water supplies, sanitation, and electricity, and due to inadequate diet, morbidity and mortality rates have increased dramatically especially among the children and the poor. A 1995 UN report indicated that the level of child nutrition in Iraq approximated those of poor African countries, given that Iraq used to be classed among the upper-middle income band of economies.

An August 1999 survey released by UNICEF, the first to be conducted since 1991, warned of a humanitarian emergency in Iraq. It showed that Iraqi children, under five years of age in the centre and south, where 85% of the 22 million live, were dying at twice the rate of a decade ago. Under age five, mortality increased from 56 deaths in 1000 live births in 1984-89 to 131 deaths in 1000 live births in 1994-98. A similar deterioration was recorded in infant mortality rates.





The director of UNICEF said if the substantial reduction in child mortality throughout Iraq in the 1980s had continued in this decade, there would have been half a million fewer deaths of children under five in the country from 1991 to 1998.

However, in the Kurdistan area, which is outside government control, under-five mortality declined from 80 deaths per 1000 live births in 1984-89 to 72 deaths per 1000 live births in 1994-99, with a similar trend registered in infant mortality. This is where the UN plays a direct role in distributing supplies to the population under the oil-for-food program. In the centre and south, distribution is effected by the government and only monitored by the UN. The adverse results in the centre and the south are due to government policy and also due to the absence of humanitarian NGOs who are present in the north but shun the government's restrictions in the areas under its control.

2) Three weeks after the UNICEF report, the UN Secretary General on 23/8/1999, submitted a report to the Security Council about the situation inside Iraq and the effectiveness of the oil-for-food program. Although he called upon the UN Sanctions Committee (implying the US) to refrain from putting obstacles, under the pretext of dual use, against exporting vital supplies to Iraq such as those concerning health and water treatment, the essence of his report seems to put the blame of the deteriorating situation on the Iraqi authorities who seem to be misallocating the food and health supplies, and maybe deliberately for political reasons.

As an example, out of the billions of dollars accruing to the program, especially when oil prices have improved in 1999, only \$6.6 million were allocated to improve the nutrition of mothers and infants. This is even a retreat from the \$15 million allocated for the same purposes during the first phase of the program when it began in December 1996, despite the much lesser amount which accrued to that phase (less than half of the \$5.3 billion per six months allocated to this one and which may go up to \$6.3 million per six months for the next phase).

3) Schools in many parts of the country, especially rural, have become in poor conditions due to the lack of financial resources. Furthermore, erosion of family income has pushed students to drop out of schools, seeking early employment. The impoverishment of the professional classes (doctors, professors, engineers, etc.) has reduced the desire among students to seek further education, especially when it has become easier to earn a living by pursuing manual or trade work, or even by committing crimes.





- 4) Due to tyranny, human rights abuses, and economic hardships, thousands are leaving the country, especially the capable professionals, most needed by a poor country such as Iraq.
- 5) Due to economic hardship, the social fabric of the Iraqi society is deteriorating. Divorce and crime are on the increase while the number of marriage is declining.
- 6) A complete generation of Iraqis is growing in isolation from the outside world. This is bound to breed alienation and fanaticism.

### Iraq's financial prospects after the sanctions

It is well known that Iraq's oil potential comes second to Saudi Arabia, with its present oil reserves of 112.5 billion barrels, making 10.7% of the world's total reserves. It may even surpass Saudi Arabia if the Western Desert and other areas are explored and developed. Some Iraqi geologists and experts put the potential Iraqi recoverable oil reserves at 300 billion or even more.

Many super-giant and giant fields (Majnoon, West Qurna, Nahr Umar, Nassiryiah, Halfaya, Ratawi, Gharraf, al-Ahdab, Tuba, Rafidain) and many other lesser fields await development. It is estimated that within five years from lifting the sanctions, Iraq's oil production capacity, with the help of international oil companies willing to invest in Iraq's upstream oil industry, can go up to 6-6.5mn bpd.

If we assume, and this is a very credible assumption, that due to Iraq's special situation, it will be allowed by OPEC to produce at capacity, then Iraq will generate very good oil income after lifting the sanctions. However, what happens to this oil income will very much depend on who is in power when the sanctions are lifted.

Rationally, Iraq's oil revenues (after paying for production cost, production sharing payments to investing oil companies, pipeline transit fees, etc.) should go towards paying for general civilian imports (as an example: around \$8 billion in 1989) and financing reconstruction and economic development (around \$5 billion per year).

## Saddam in power after removing sanctions





If Saddam's regime is in power after removing the sanctions, Saddam's first priority will be re-armament, which would cost around \$5 billion a year.

Furthermore, because in the presence of Saddam, Iraq will be a pariah state and in order to not reward Saddam for his war crimes and atrocious rule, it is most likely that Iraq will be compelled to pay for war reparations (the UN received about \$300 billion of claims but may only endorse around one-third of it) and will also be compelled to pay its foreign debts (around \$94 billion by the end of the year 2000).

Under such scenario, and given Saddam's priorities, lack of care to his people, and absence of UN supervision, it is very likely that the Iraqi people may fare worse after the sanctions are lifted and the oil-for-food program is ended, if Saddam's regime continues in power. The oil revenues will have to go towards paying war reparations, debt, re-armament, and expenditures on a police state. There won't be much left for civilian merchandise imports or reconstruction and economic development.

#### Democratic regime in power after removing the sanctions

If Saddam's regime is replaced by a different one, especially if it is a peaceful democratic regime, there is a strong likelihood that:

- a) The war reparations may be annulled (precedent: Germany after the 2nd World War), and the US has been hinting towards this kind of possibility.
- b) The foreign debts issue will be addressed favourably. Some debts forgiven, others reduced, interest rate reduced, debts rescheduled, Iraq buying its own debt with large discounts in the secondary market, etc.).
- c) Under such conditions, Iraq will be able to stabilise its economy through combating inflation and improving the exchange rate of the Iraqi Dinar (the official exchange rate is ID1=\$3.2 while the present market rate is in the range of \$1=ID1500-2000).

Furthermore, considering the Iraqi people's long suffering, and to reward and enhance the stability of this country and the region as a whole, the international community, especially the US and its allies may re-enter Iraq and participate with vigour in rebuilding the country through facilitating loans, guaranteeing credits, transferring technology, and encouraging private investment. Under such scenario Iraq may regain its economic stability and health within the first decade after the sanctions are removed.





# Role of the private sector

Since the onset of economic development planning in 1950, all Iraqi governments' investments were under the ownership of the public sector. Furthermore, in 1964 the Iraqi government nationalised all private enterprises with capital exceeding ID70,000 (around \$200,000). The result was a huge growth of an inefficient and losing public sector controlling more than 75% of the GDP's value added in 1980. To make matters worse, the nationalisation measures resulted in the continuous flight of Iraqi private capital and emigration of Iraqi entrepreneurs and good managers.

Realising the adverse economic effects of this policy, the Iraqi regime moved towards a partial market economy by privatising, in the second half of the '80s, agriculture and some industrial enterprises. However, the oil industry, chemical and petrochemical industries, military industries, heavy industries, electricity, communications, etc. remained in the hands of government.

Such move did not realise its goals and was more of a drastic failure than a success because, simply, the conditions to promote an active private sector were non-existent. Some of the reasons contributing to the failure were:

- Lack of capital markets and investment banks.
- Lack of public participation.
- Lack of trust between the people and government
- Lack of proper legal environment for the protection of property ownership.

With the privatisation of those enterprises, all that happened was the transfer of the government's monopoly to the monopoly of well-connected individuals.

What Iraq needs after removal of the sanctions and stabilisation of the economy is expansion of its manufacturing and agricultural sectors. These are the two sectors with the best potential for providing employment and increased exports. In order to develop these two sectors and achieve sustainable economic growth, the following steps have to be taken:

- 1) Privatisation of the public sector.
- 2) Providing the proper legal and economic environment conducive to private investments.
- 3) Opening up the doors of Iraq for Arab and international investors.





- 4) Development of the Iraqi human resource base, especially in the areas of health and education.
- 5) After this long period of dictatorship and misrule, the stability and progress of the Iraqi economy will need good governance exemplified in democratic decentralised rule and respect of the law.
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He was an engineer and director, Ministry of Oil, Iraq (September 1962–October 1982); Executive Vice President, Intoil, Inc (January 1986–December 1994); Senior Energy Economist and Analyst, Centre for Global Energy Studies (CGES) (January 1999–February 2010). In 2003, he became Oil Adviser with the Coalition Provisional Authority in Baghdad but resigned after four months.

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