Balance of Payments Determination and Reserve formation

Materials for presentation

Dr. Ahmed Ibraihi Ali

Conceptual and Accounting Framework

The balance of payments summarizes all economic transactions between a country and the rest of the world over a specific period. It includes flows of goods, services, financial assets, and transfer payments, and is broken down into three main accounts: the current account, capital account, and financial account. The latter includes change in reserve , therefor:

Current account+ Capital Account + financial account=0 ;

Current account +Capital account + financial account excluding change in reserve +change in reserve= 0

A country's reserve assets at a specific point in time are the cumulative result of all the changes that have occurred in those reserves up to that point. The total stock of reserves is equal to the initial reserve level plus the sum of all subsequent increases (accumulation) and decreases (depletion).

An Account framework to understand the process of central bank reserves formation and using, starting with the identity of Resources and Uses. Where M= Imports of goods and services; C= Household consumption; G= Government expenditure; I= gross capital formation; X= exports of goods and services; GDP= Gross Domestic Product; GNDI =Gross National Disposable income; BEI= balance on earned Income, or net primary income abroad; BTI= Balance on transfer income, i.e. net current transfer;

CAB= current account balance, S=saving , S_p =Private saving; S_g =government saving; I_p= Private investment; I_g =government investment.

GDP= C+G+I+X-M …….(1)

GDNI= C + G + I + X – M + BEI + BTI ……..(2)

CAB = X – M + BEI + BTI ……(3)

From (2) and (3) CAB can also be seen as the gap between disposable income GDNI and expenditure:

CAB=GNDI - C- G -I ……..(4)

If G for government consumption, and I for gross domestic capital formation then:

S=GNDI – C- G ……(5)

From (4) and (5):

CAB=S-I ……..(6)

From(6) the Current account balance reflects the saving and investment behavior: increasing in consumption (decreasing in saving) will reduce the Current account Position i.e. less surplus or more deficit.

Distinguishing between the private and government sectors :

CAB=$(S_p-I_p)+(S_g-I_g)$ ……..(7)

The identity (7) shows that if the negative gap in the government sector is not offset by a positive gap in private sector the Current Account will be in deficit. Let KAB Capital account Balance; FAB_A Financial account Balance with out balance on reserve assets transactions BRT, or Change in Reserve.

The Identity of the balance of payments is:

CAB+KAB+ FAB_A +BRT=0 ……..(8)

Let us define for simplicity Overall Balance OAB,

OAB= CAB+KAB+FAB_A ……(9)

OAB+BRT=0 ……(10)

If OAB negative BRT will be Positive and in this case the deficit of OAB financed by CB Reserve and declined by the amount of BRT. If OAB positive BRT will be negative and the reserve of the CB increased by the amount of BRT. If the OAB add to reserve the sign of BRT negative and positive when the OAB in deficit position.

Let us consider the FX balance in Iraq: FXR for Foreign exchange resources, GM for government imports of Goods and services. ONU government net other uses of FX, FXS for MOF FX Sales to CB; FXP for CB sales to FX market. FLD government Foreign Loans disbursement; LR for government Loans repayment; DS for Debt Service ; DGFA Adding to government assets Abroad.

ONU= DGFA+ LR+ DS -FLD

FXR= GM+ONU+ FXS ……(11)

BRT= FXS – FXP ……(12)

BRT= FXR- GM- DGFA-LR-DS +FLD -FXP……..(13)

We can see that the process of reserve Formation through BRT is totally contained within the decision making of public finance. This is why the reserve formation can not be understood as a central bank independent process.

Demand For FXP= Private Sector imports of Goods and services PM , and Net private Sector investment abroad PIF, considering population N we have; Demand for imports depend on per capita income and Real Exchange rate RER of I.D. ; and PIF depends on saving gap , real exchange rate and other factors O :

FXP=PM + PIF ……..(14)

PM=N *f{(GDP/N), RER} ……(15)

PIF=f{(S_p -I_p), RER , O} ……(16)

ΔRER= Domestic inflation -Foreign inflation ……(17)

Natural Resource Rent and Uncertainty

Natural resource rents % of GDP an indicator highlight the fluctuation of Exports revenue and FX inflow.

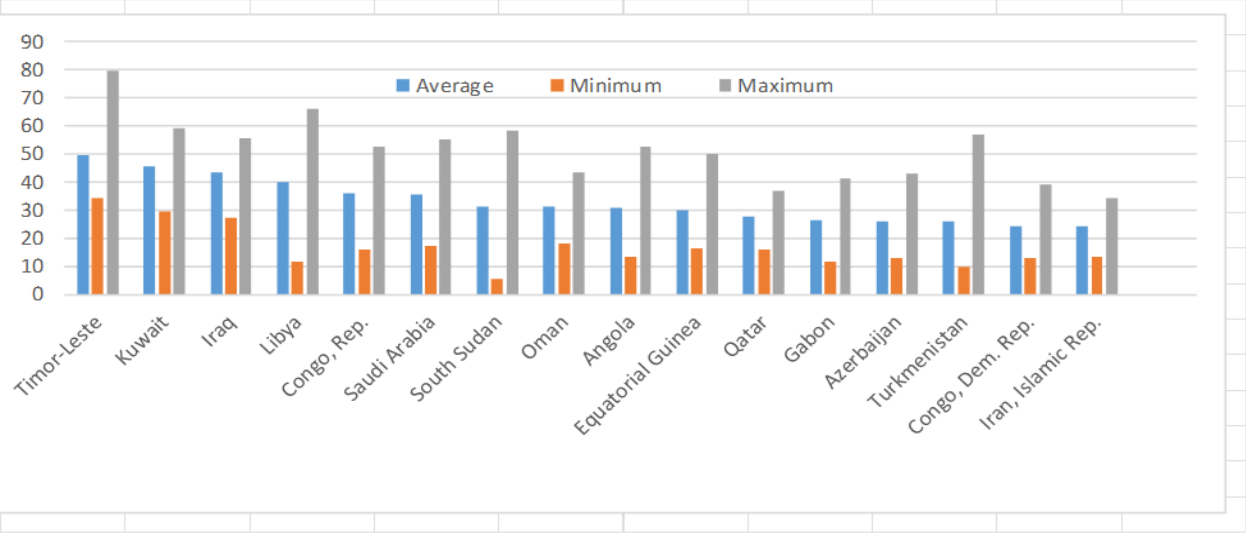
The range between minimum and maximum very wide. This analysis could be useful to see the potential depletion of reserve. Commodity exporting economies are special cases can not be addressed by a general rule deduced from the typical economy of the main stream literature but through A Case Theoretic Approach.

Natural resource Rent % of GDP :15 Years, World Bank Open Data

	Average	Min	Max	Min/Average	Min/Max
Timor-Leste	49.38	34.39	79.43	69.65	43.30
Kuwait	45.64	29.28	59.07	64.17	49.58
Iraq	43.53	27.42	55.69	62.98	49.24
Libya	40.00	11.48	66.06	28.70	17.38
Congo, Rep.	36.15	15.89	52.64	43.95	30.18
Saudi Arabia	35.43	17.32	55.02	48.88	31.47
South Sudan	31.35	5.60	58.28	17.88	9.62
Oman	31.23	18.05	43.27	57.80	41.72
Angola	30.90	13.31	52.56	43.06	25.31
Equatorial Guinea	29.81	16.46	50.14	55.22	32.83
Qatar	27.57	15.98	36.93	57.97	43.28
Gabon	26.24	11.66	41.07	44.45	28.40
Azerbaijan	26.17	13.00	43.04	49.69	30.21
Turkmenistan	25.92	9.66	56.97	37.26	16.95
Congo, Dem. Rep.	24.41	12.75	38.83	52.24	32.84
Iran, Islamic Rep.	24.26	13.14	34.24	54.14	38.36

Country	Average	Min	Max	Min/Average	Min/max
Brunei Darussalam	23.16	13.75	33.60	59.39	40.93
Mongolia	22.36	9.88	42.22	44.19	23.40
Algeria	22.35	12.82	32.87	57.34	39.01
Liberia	21.13	14.03	28.37	66.39	49.43
Chad	21.11	11.97	33.92	56.70	35.29
United Arab Emirates	20.69	11.81	29.78	57.06	39.64
Cabo Verde	20.59	9.50	49.21	46.14	19.30
Burundi	20.32	13.13	33.05	64.60	39.72
Kazakhstan	20.00	9.33	33.25	46.65	28.06
Papua New Guinea	18.49	11.67	27.90	63.10	41.82
Solomon Islands	18.41	12.93	22.92	70.24	56.42
Bahrain	18.14	9.65	26.99	53.20	35.74
Venezuela, RB	17.84	10.54	24.48	59.10	43.07
Mauritania	16.65	2.44	38.40	14.65	6.35
Yemen, Rep.	15.87	0.77	33.87	4.83	2.26
Zambia	15.63	7.92	35.26	50.66	22.45
Uzbekistan	15.50	6.72	30.05	43.35	22.36
Somalia, Fed. Rep.	15.38	10.73	19.55	69.79	54.90
Suriname	15.23	4.60	31.93	30.20	14.41
Guinea-Bissau	15.12	9.89	19.87	65.40	49.76

Iraq and similar countries in resource rent fluctuations



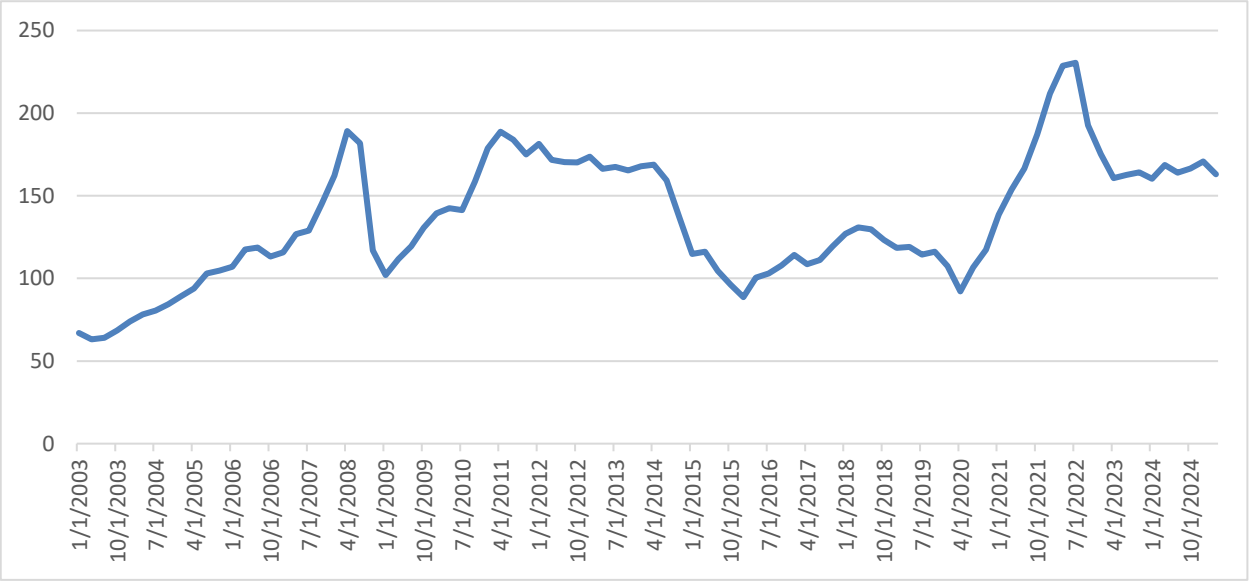
Commodity Price Variations

The fluctuation of FX resource directly related to the characteristics of commodity prices, including oil price, which are well known of wide range variations. Also, almost irregular and unpredictable repeated cycles particularly since the early 1970s. Booms and slumps in commodity prices have been common in recent decades. Global macroeconomic shocks have been the main source of commodity price volatility. Potential supply of oil has been increasing, particularly from non-OPED sources, beyond the global demand.

The prospects concerning global demand for oil look bleak according to outlook report of IEA.

We should take measures to reduce reliance on oil export, and start a program to diversify our exports base by developing new sources of FX through export-led Industrialization.

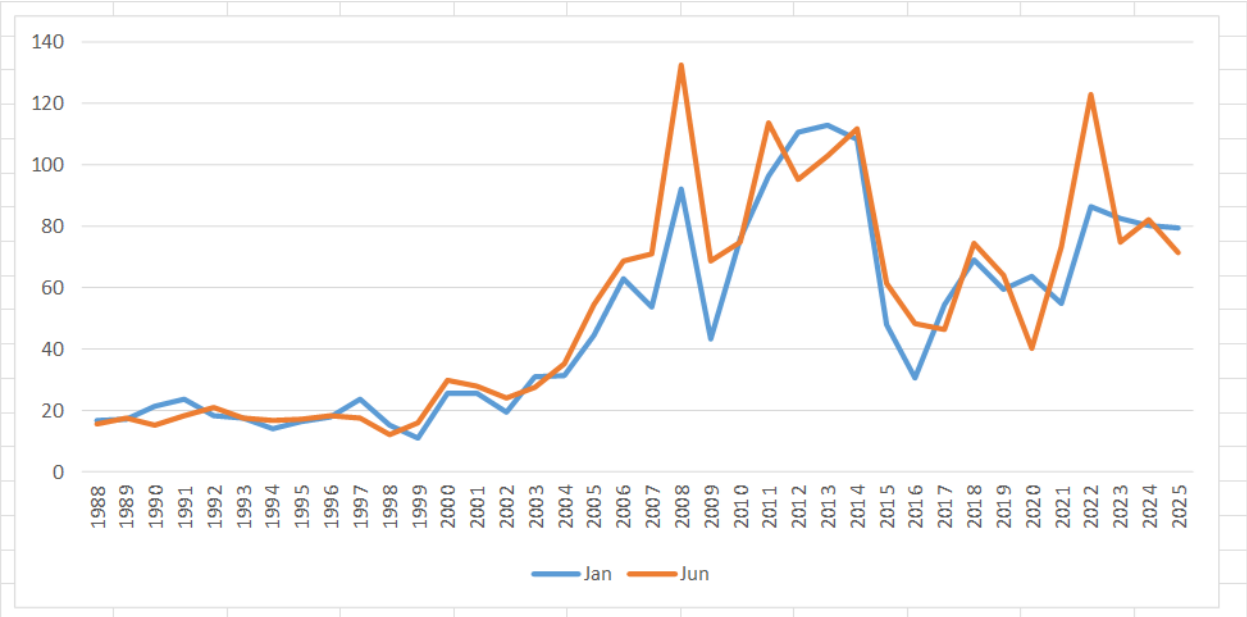
Global Price Index of All Commodities



Source of Data : FRED

Fluctuations of Oil Price as in the diagram combine different sorts of cycles: Short like the difference between January and June, local and global of changing duration. I will consider this behavior to suggest adequate reserve.

Brent Price US $

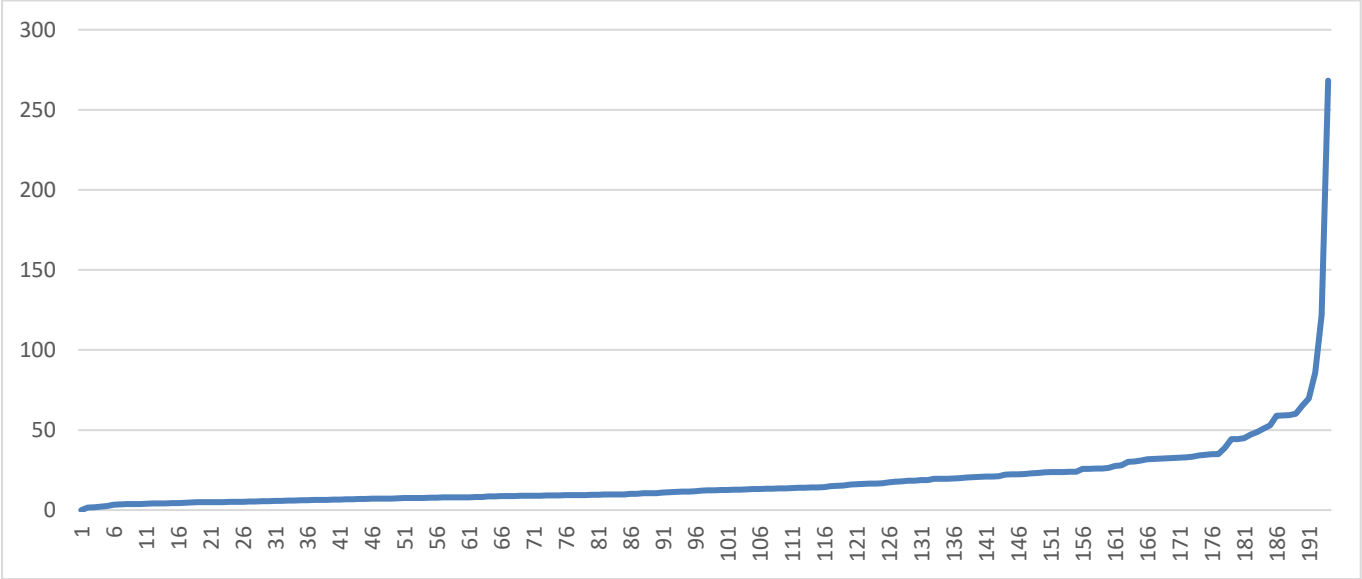


We can see that Iraq is the most dependent on rent of oil exports, and this feature emphasize the necessity of exceptional reserve compatible with peculiarity of Iraq (the export basket has only one good) remembering the future of oil.

Current Account and Reserve to export relation: Wide Disparity

The diagram presents minimum Current Account Position which is the main source of overall balance of payments deficit. There are 33 countries their positions between (60%) of GDP to (30%), while other 20 countries their current accounts always positive. It is difficult to find a behavioral function reliably applicable to all these cases.

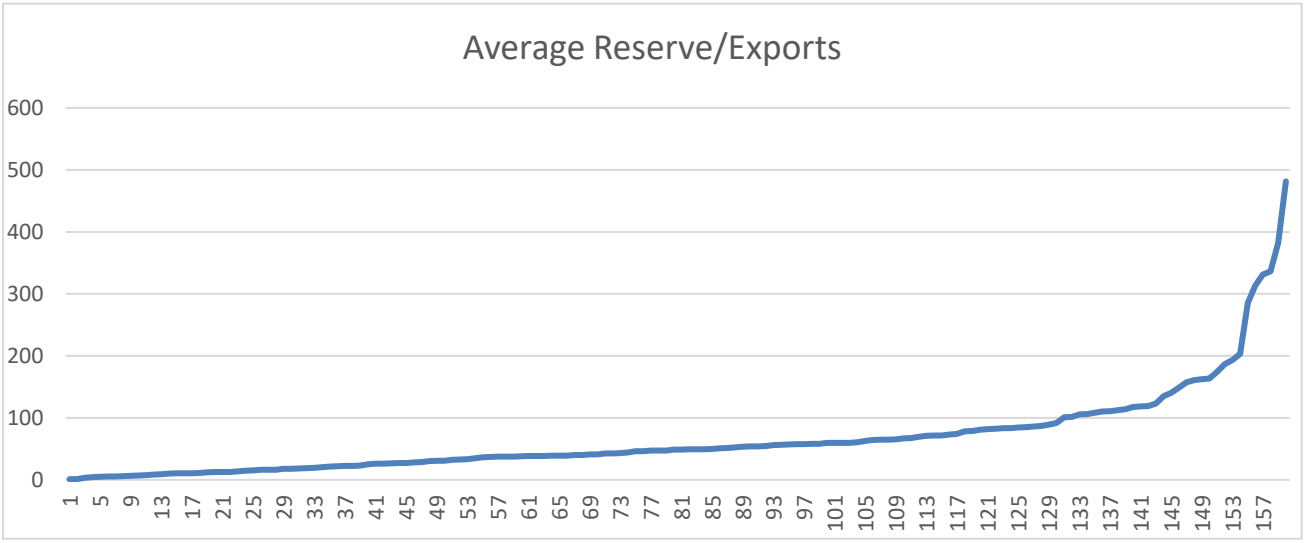
Spectrum of the range between maximum and minimum of Current Account Position % of GDP, (all Countries), 2010- 2024.



The average reserve to average export % for the period 2015- 2024 of 160 countries is 66.9 , the median 48.8 , Maximum 481.4 , the minimum 1.1 . In 50 countries the indicator less than 31 , and 130 countries the average less than 100, 29 countries their reserve to export 100% and above. The ranking places Iraq 128 starting from the lowest. Iraq export behavior more volatile than the average of the sample for which the range between maximum and minimum records of exports represents 69.6 % of the average annual export , while the median 62.97%. In Iraq the range 99.19% . The correlation, 0.068 , between reserve to export and export volatility was very low in the sample countries for the said period.

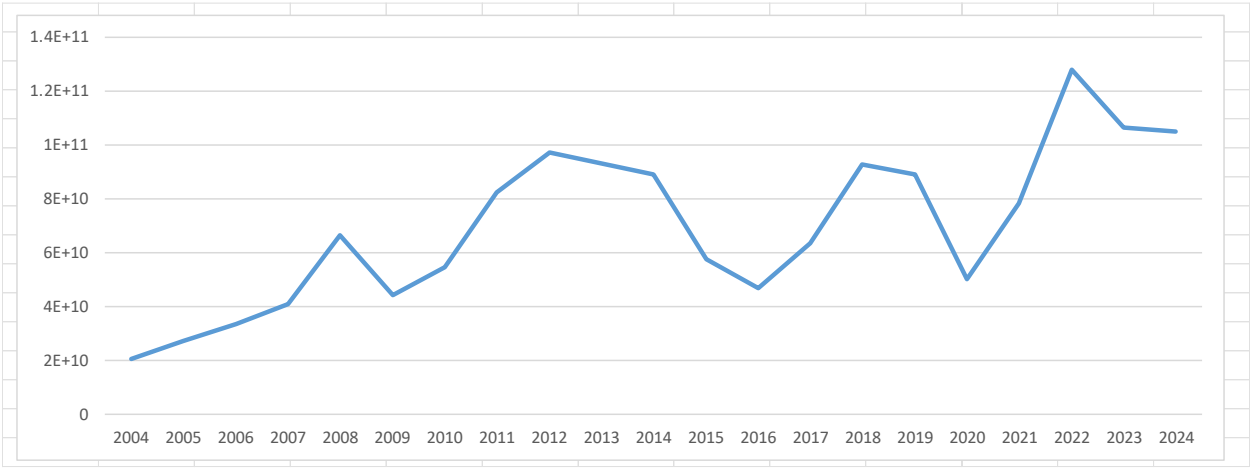
The required reserve, as a function of export volatility and macroeconomic variables, varies from one country to another. Countries of reserve currencies, or international fully convertible , uses the reserve for different functions compared with Iraq. The later hold reserve to finance potential balance of payments deficit, while the former for stabilization of their currencies in addition to the issues of

interest rate parity and other particulars to them. Also the reserve issues inuirement common currency area like Euro are different.



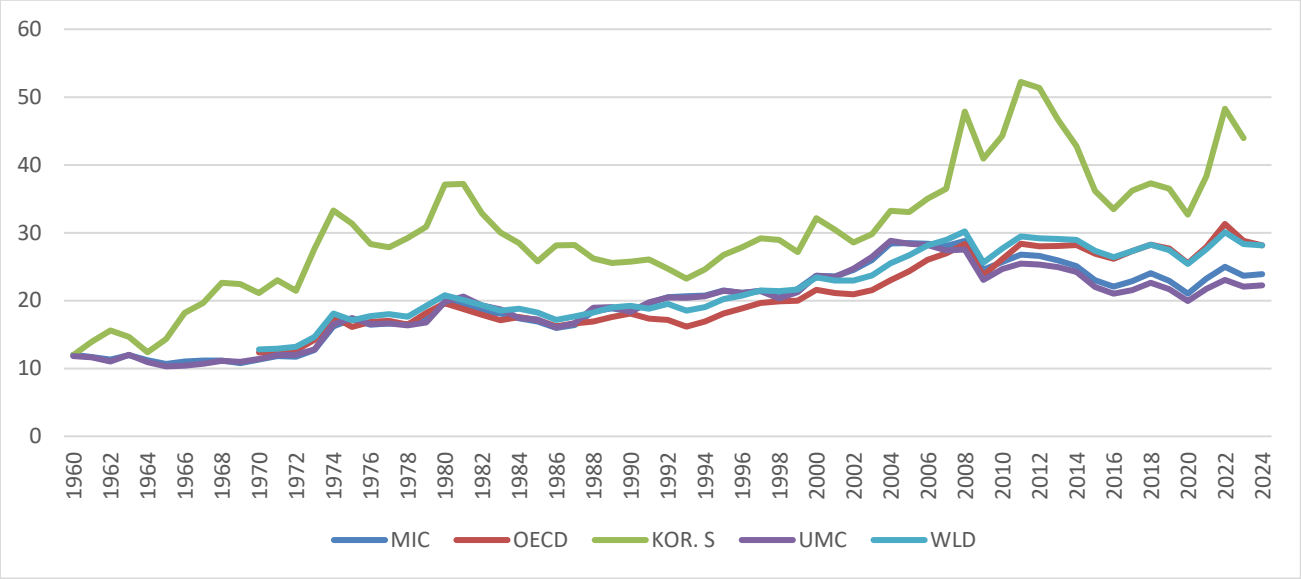
The value of Our exports of goods and services is rising but later you would see that its weight in GDP is declining.

Iraq Exports of Goods and Services in Value terms US $ 2004- 2024

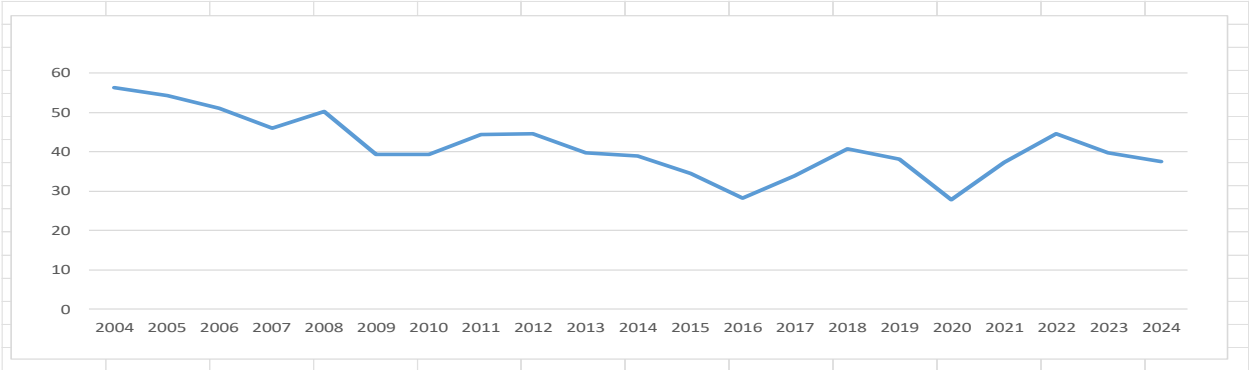


The curves of Imports of goods and services % of GDP reflect the trend of more openness, on average the growth rate of imports higher than of GDP , i.e. income elasticity of imports more than 1. Iraq can not be detached from the world pattern , so the growth of imports will be more than the growth of GDP, but the growth of exports revenue much less , probably even zero or negative. This is another reason to support reserve.

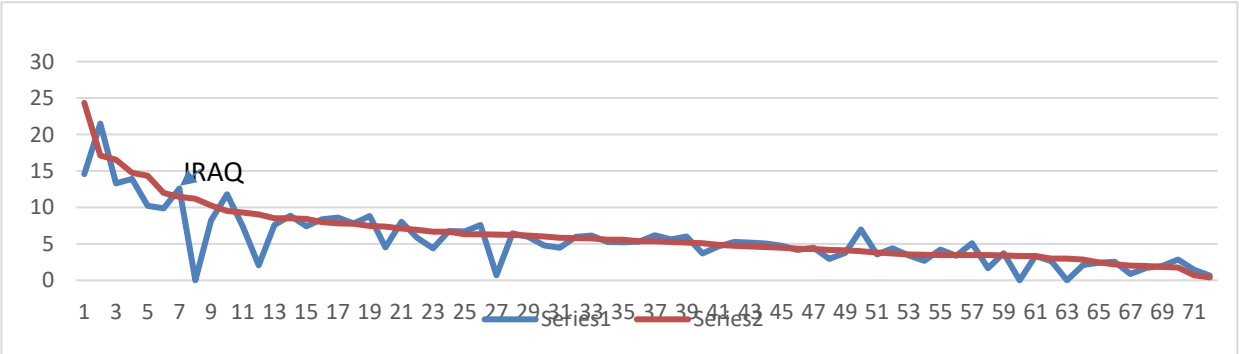
Imports of Goods and Services % of GDP



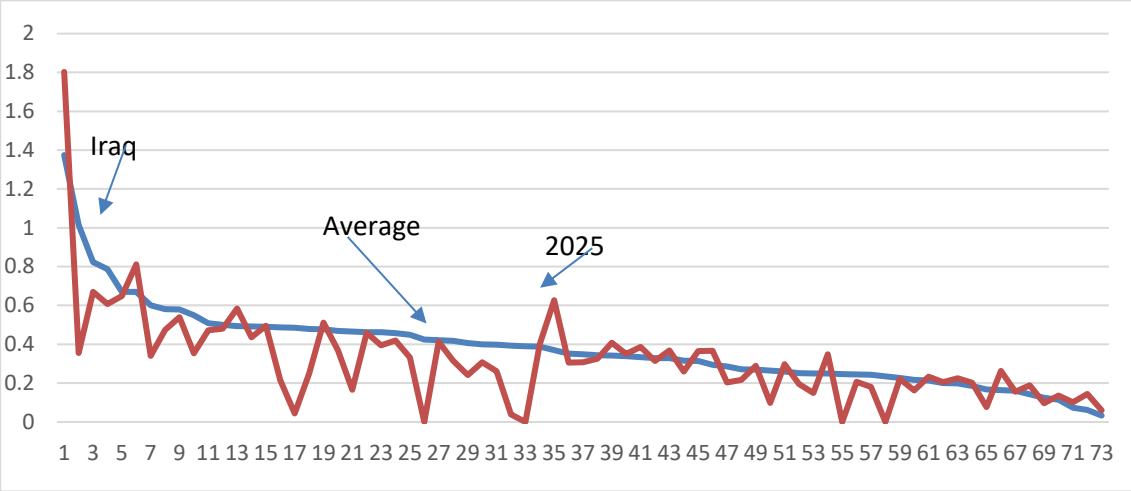
Exports of Goods and Services % of GDP in Iraq 2004- 2024.



Reserves : Months of Imports, IMF 2025



Reserves % of Broad Money



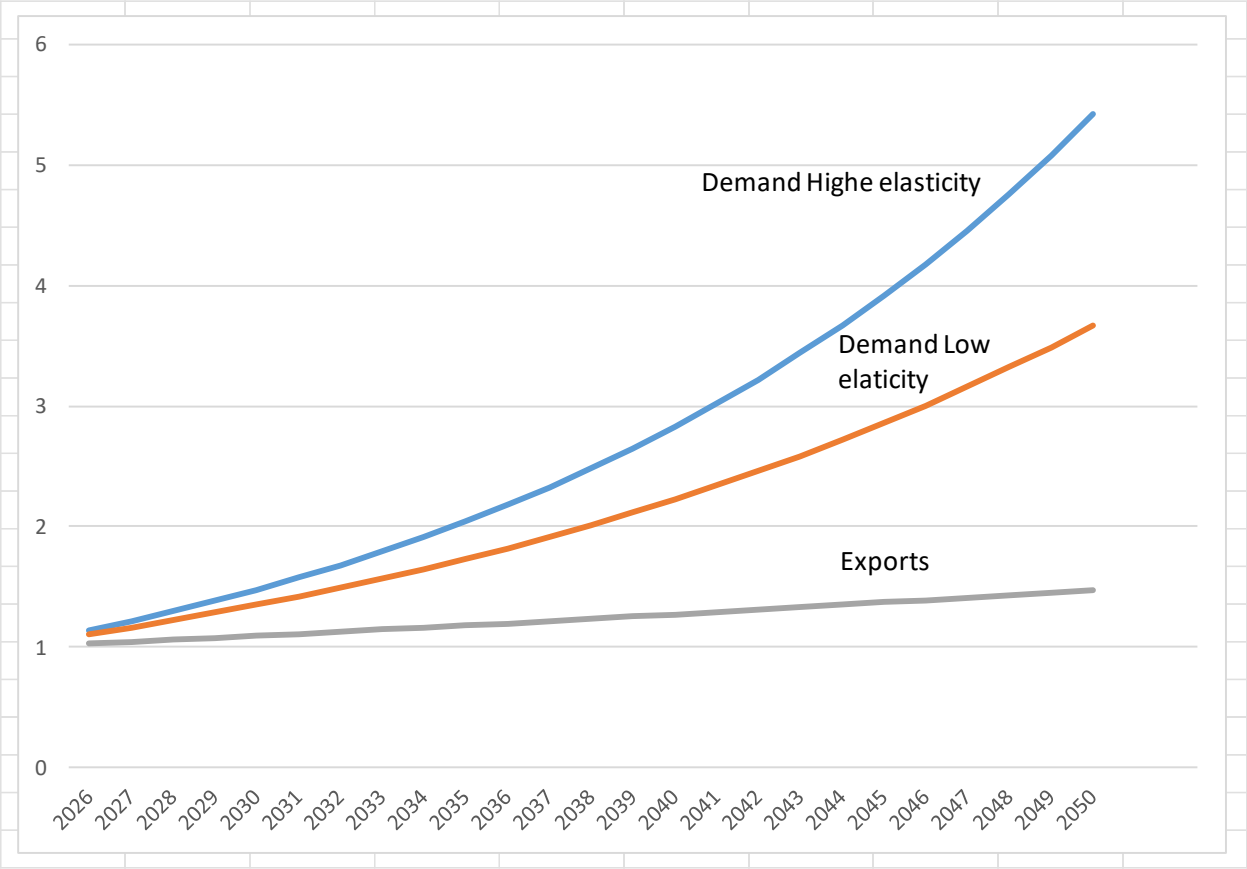
Broad money to GDP in Iraq compared with other countries considering the level of development in terms of GDP per capita
Is lower than the pattern. In other emergent and developed economies the banks create deposits through credit therefor deposits represent more than 90% in many countries. In Iraq money expansion depends on central bank induced mainly by the public budget and its indirect effects. In this context it is unlikely that money could be an independent source of demand for foreign exchange.

Simple Scenario for Balance of Payments and Reserve

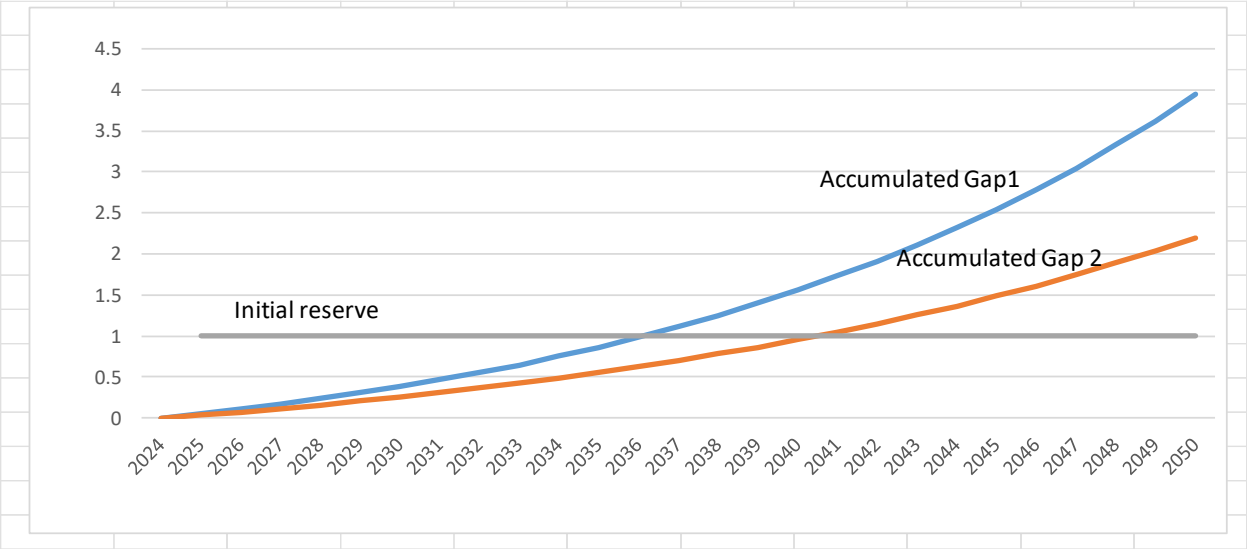
This calculation based on the following assumptions: the price of oil be constant in real term, i.e. the expected annual average increase in nominal price will equal the inflation rate in USA, this optimistic assumption considering the most influential outlooks of OPEC and IEA. The growth in export of oil supposed to be 1.5% annual average from the base year to 2050, this is more optimistic than OPEC but pessimistic viewing from MOO. The reserve in the base year equals the average annual exports which is also the export of initial year of the scenario.
The annual growth rate of population 2% , which is less than the prevailing rate anticipating declining of the rate, this is optimistic but consistent with world experience. The annual growth rate of GDP per capita 3%. it is lower than the required, since we need more than 25 years to double the GDP per capita. The income elasticity of demand for foreign exchange 1.5, this is inducted using the world total data of GDP and Imports of goods and services in addition to Malaysia, but possibly the elasticity in Iraq be lower and the data of Iraq support this intuition. Therefore, tow paths of demand constructed for the two elasticities. Also, the demand for foreign exchange is a function of income and real exchanged rate of Iraqi Dinar. The real exchange rate will be increased by the difference

between the rate of inflation in Iraq the rate inflation abroad. If the real exchange rate could be kept constant for the entire period it will have no effect, therefore I assumed that the central bank could keep the real exchange rate constant. The results presented in the following two diagram without the details of calculation.

Demand for FX



Accumulated Gap and the time of reserve depletion, the scenario is optimistic , the balance of payments Crisis may be no later than 2030 .



Borrowing abroad to finance the gaps only exacerbates the problem, since the future payments will be increased by the debt repayments and debt services, while the exports revenue will not probably be increased or most likely steadily decease. But borrowing to finance projects for exports diversification may be sound.

Shrinking exports revenue creates problems can not be solved by monetary and fiscal arrangements but only by different economic strategy. Austerity and curbing liquidity these prescriptive are neither socially acceptable nor politically affordable.

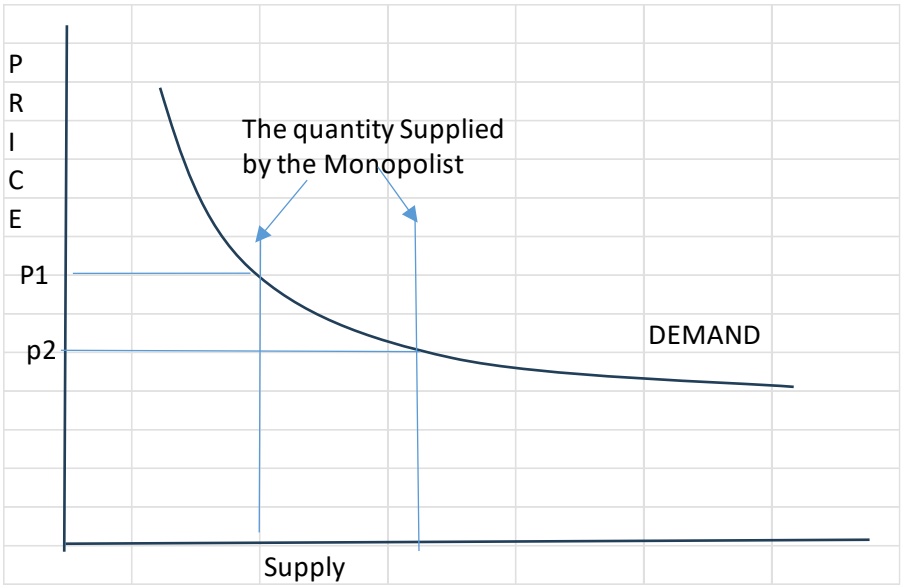
Revenue of Iraq exports for the period 2004-2024 , using the WB data accumulated to 1.47 trillion US $.

Central Bank and Public Finance

A competitive market made of agents that are price taker, while a monopoly is a price maker. In a competitive market many participants, on both sides of the market, have no control over the price, while a monopoly is a "price

maker". A monopolist, like CBI in FX market, however, is the single seller and has significant power to set the price, subject to market demand.

FX Market of One Agent in the Supply Side



Perfect competition is not a realistic assumption for the foreign exchange (FX) market, it is often used as a theoretical benchmark for analysis. Real-world FX markets are considered imperfectly competitive because they have aspects that violate the strict conditions of perfect competition. Notwithstanding in a typical economy, the foreign exchange (FX) market is largely independent of central banks, as it is a massive, decentralized market driven by supply and demand, but central banks can influence it through intervention and policy decisions. The FX market is often studied as one of the closest real-world examples to perfect competition, that is to highlight the special case of our FX market in Iraq.

Economists use the perfect competition model to understand how supply and demand fundamentally work. The assumptions behind a typical FX market, particularly from an idealized economic model perspective, include rational expectations, efficient markets, symmetric information, and minimal transaction costs. . The model helps in analyzing real markets to identify and quantify how much a real market deviates from this theoretical ideal. The FX market in Iraq is

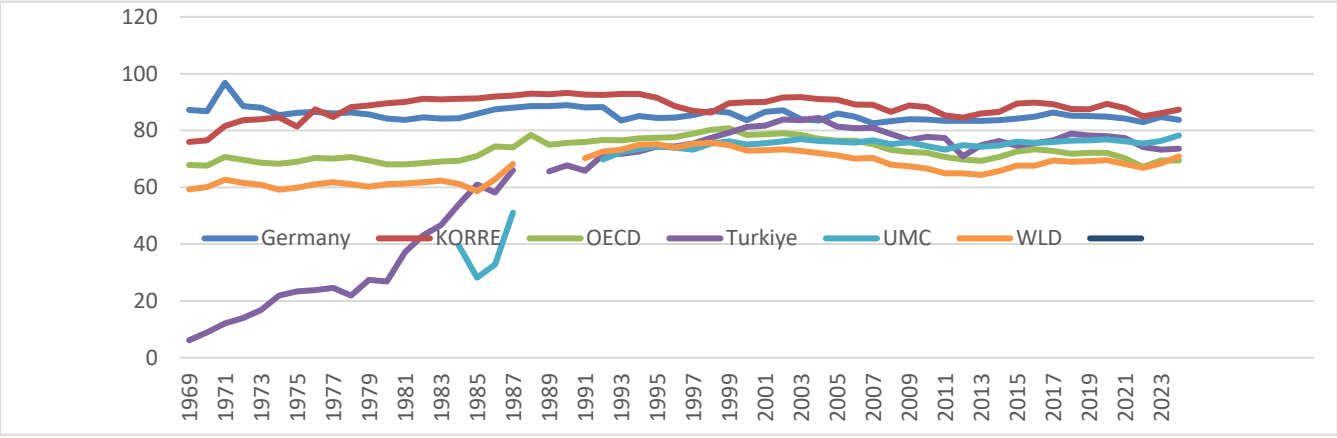
not a deviation from the typical market but it is a different kind of market has its own mechanism and objective laws.

The typical central banks form reserves through intervention, primarily by purchasing foreign currency in the foreign exchange market, which adds them to the central bank's reserve holdings , and selling foreign exchange to stabilize the exchange rate, this intervention reduces the reserve. By buying and selling the central bank ends up holding the reserve act as a buffer against future demand shifts.

In Iraq the central bank reserve formation is totally contained within the public finance, it is the summation of consecutive difference between MOF selling FX to CB and the latter selling to FX market. We don't have the process above mentioned. Based on these hard facts you can not understand the process of reserve formation independently of public finance. The duality of oil revenue as a major source of finance and the only source of FX. To conclude the FX market is not independent of the CB and reserve formation of CB depends on oil revenue, which official owned by the government budget, and government expenditure which is their decision.

APPENDIX

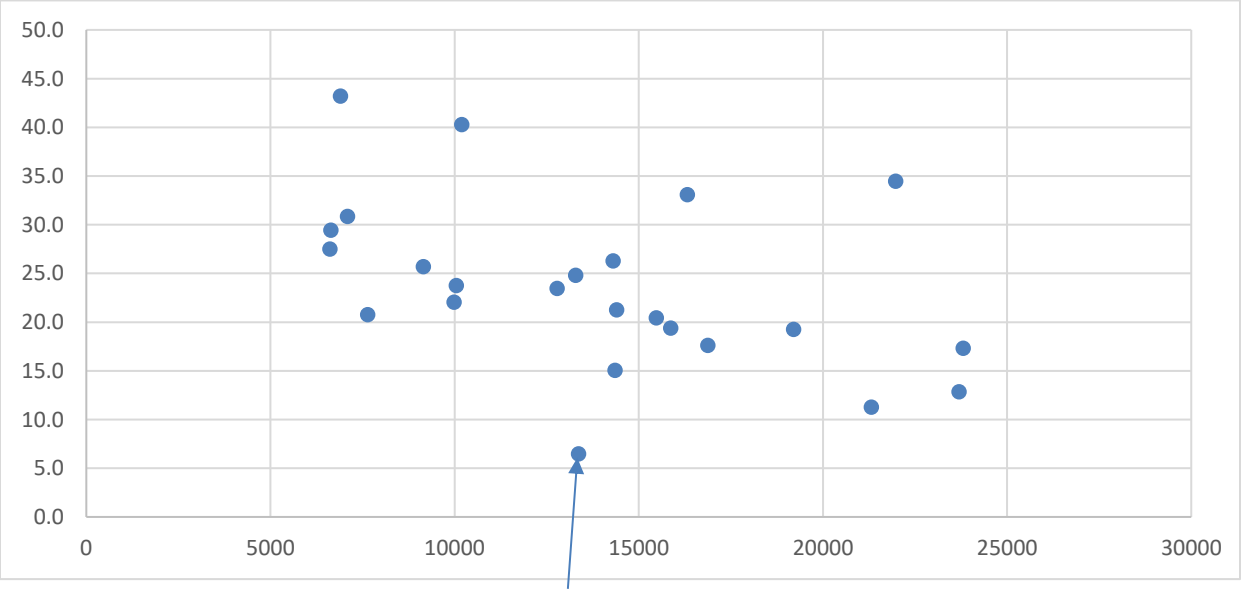
Manufacturing goods exports % of Total Merchandise Exports



The diagrams explains the domination of manufacturing goods in foreign trade, also the manufacturing sector the most dynamic and the main source of potential

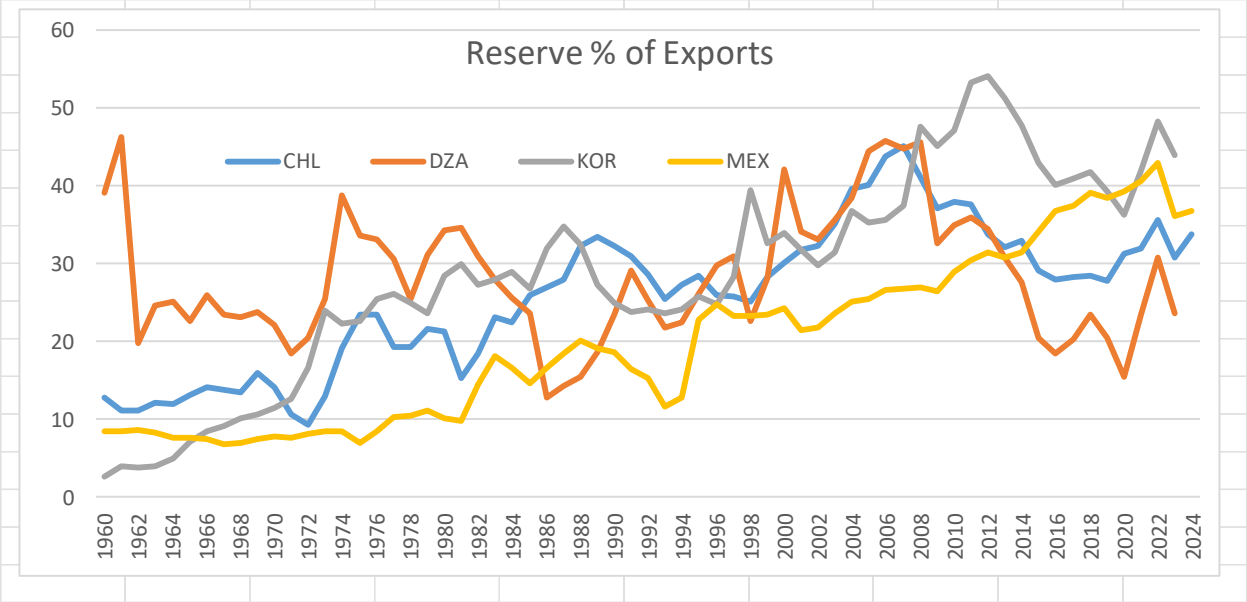
diversification. Seeking for more rent will reinforce and strengthen the prevailing characteristic of oil and services economy which has no serios solution to increasing open and disguised unemployment.

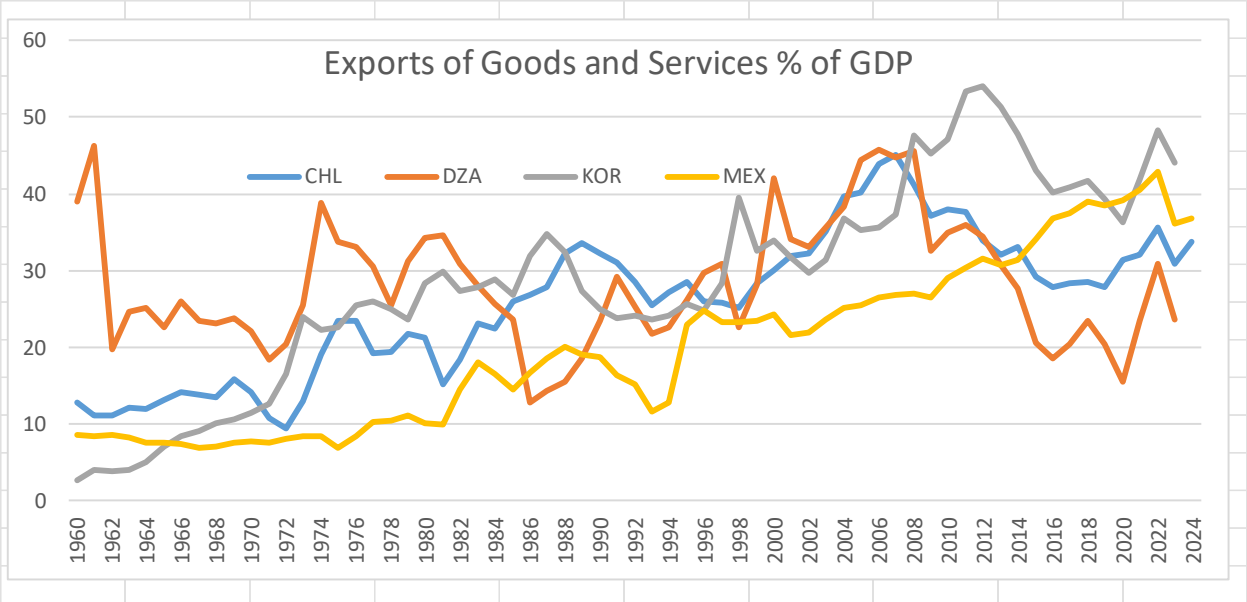
Agriculture and Manufacturing value Added % of GDP Against GDP PPP Per Capita , Average (2020-2024)

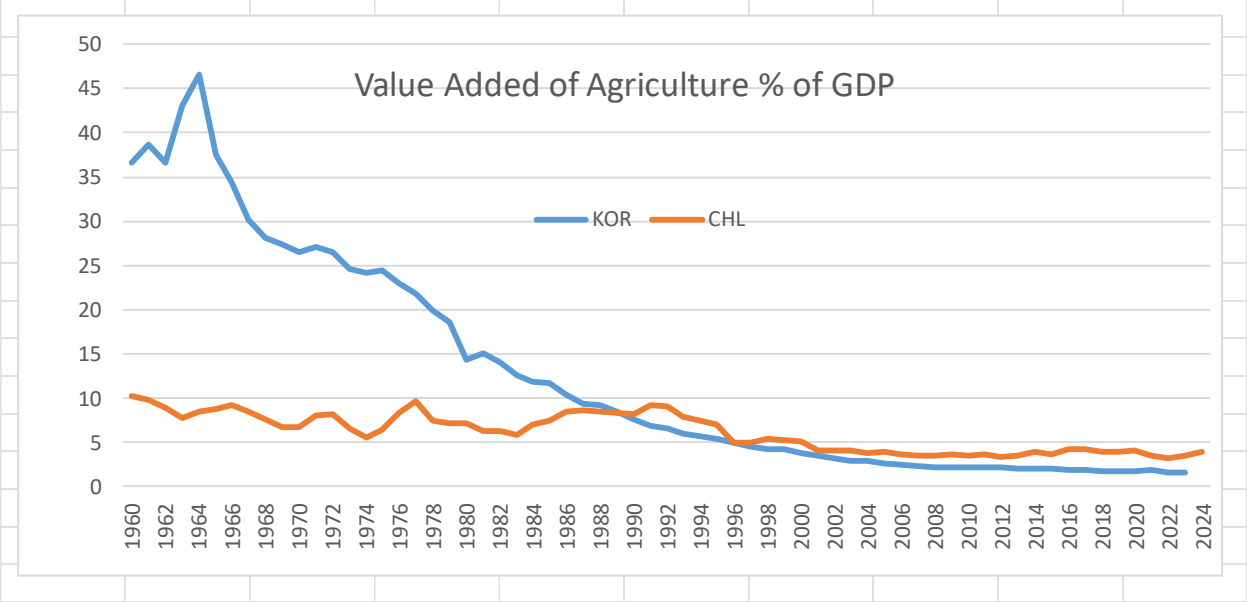


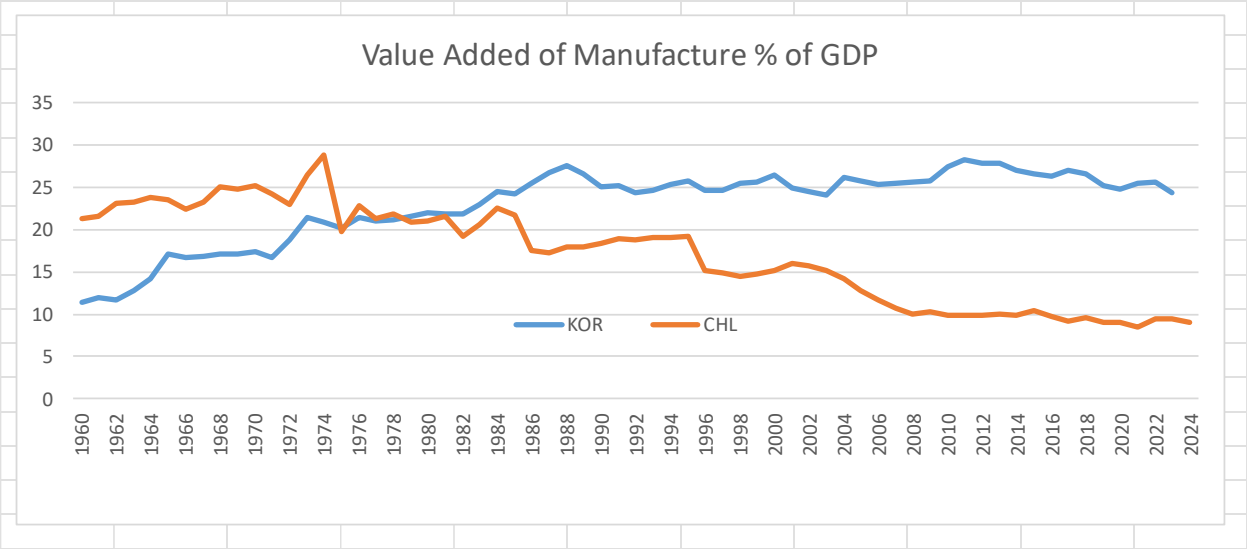
The Countries Included in this sample their population between 15- 90 million , and per capita PPP GDP between 5000- 25000, the countries comparable to Iraq in the level of development and size of population. Weak non-oil sectors of

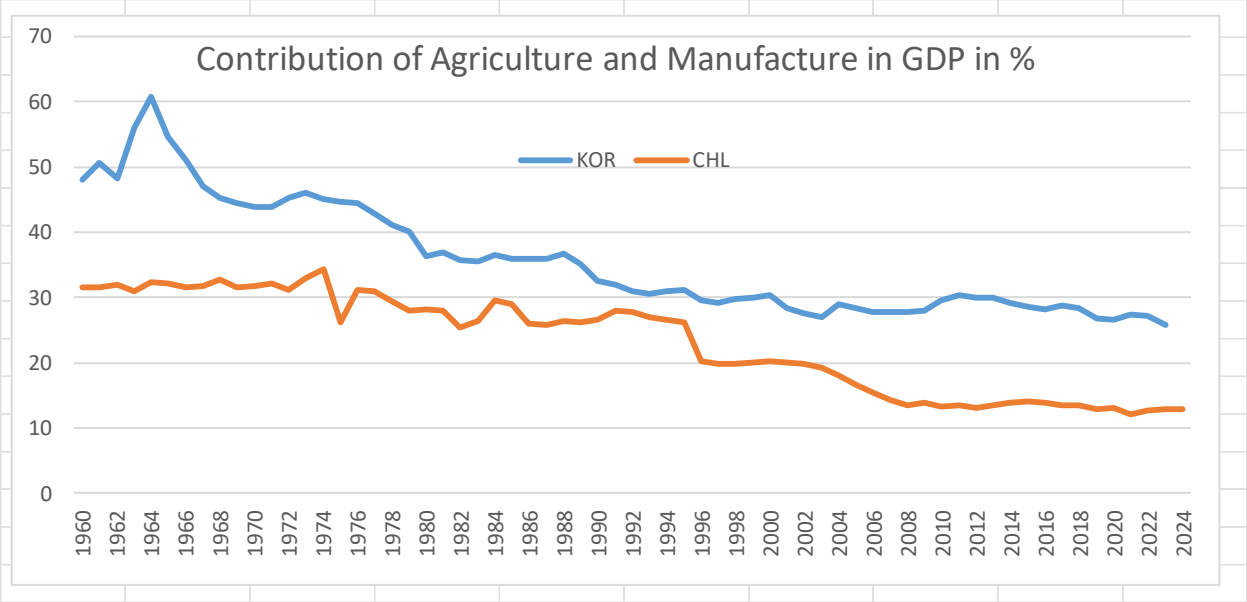
tradable goods represented by agriculture and manufacturing add more to the necessity of reserve considering the very limited possibilities to substitutes foreign goods in the hard time.




Exports of Goods and Services % of GDP
CHL
DZA
KOR
MEX
60
50
40
30
20
10
0
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024

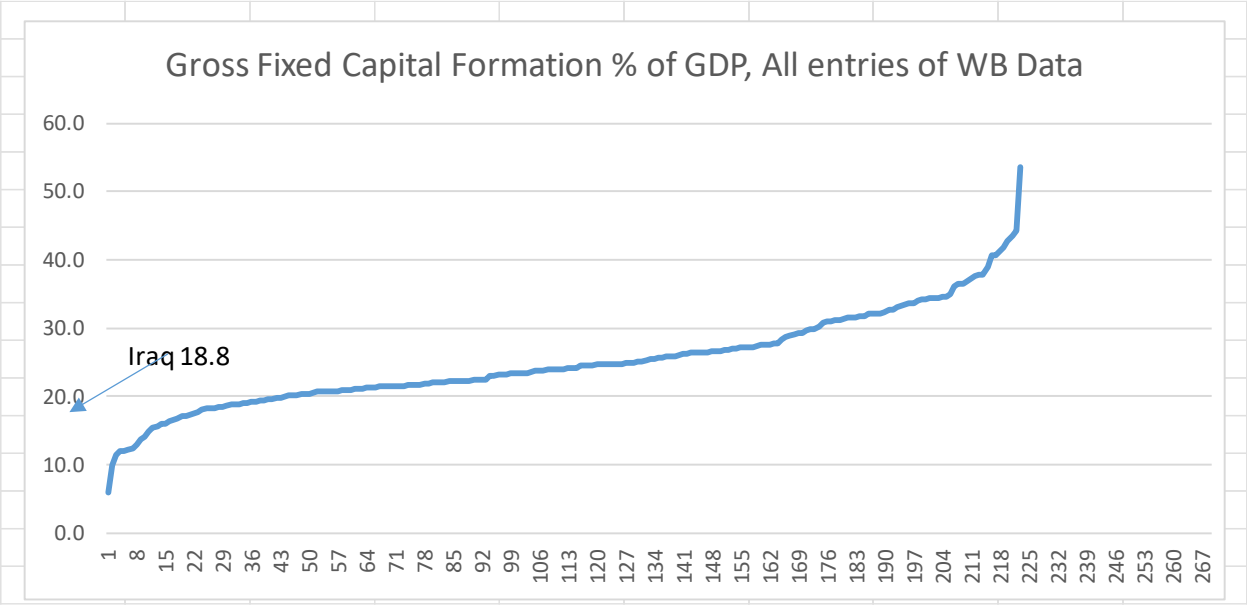

Value Added of Agriculture % of GDP
KOR
CHL
50
45
40
35
30
25
20
15
10
5
0
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024



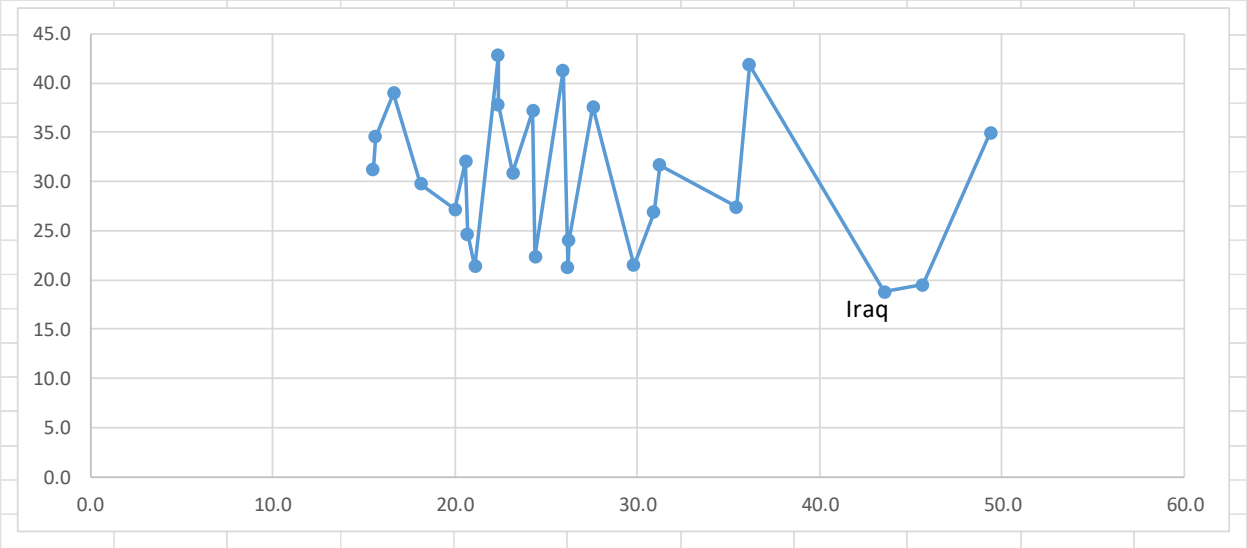


The Patterns Presented in this appendix reflects the objective laws of structural changes through the course of development. the relative size of agriculture and manufacturing in Iraq should be enlarged buy heavy efficient investment; this is the only meaningful strategy, and the performance of economic management should be evaluated based on the true commitment to this historic mission. Isolating monetary sector from the real economy is a wrong way of thinking should be abandoned in Iraq.

Capital formation and related notes



Gross Fixed Capital Formation % of GDP in resource Rich economies



The two diagrams show that the level of investment, Gross capital formation, is very low in Iraq. It is below the world level and too much lower than the prevailing level in upper middle-income economies. The first diagram compares Iraq with all countries and groups. The second diagram presents Iraq with other natural resource rent economies. In spite of these shocking facts some prominent figures, in economic and financial departments of government in addition to

professors in economics, were enthusiastically suggesting to invest a portion of oil revenue abroad.

Also, in spite of the vital necessity of central bank reserve, considering the oil market uncertainty, some prominent professors questioning the holding these assets in terms of opportunity cost. They ignored the cost of shock to the economy in a case the reserve not enough to finance the deficit caused by geopolitical or market events. The central bank reserve is the main factor to maintain confidence, and respond vigorously to abort potential speculative attacks.