

Fuel Prices and Inflation in Iraq: *The rise and fall of a supply shock*¹

Ali Merza

I. Inflationary trends: 2003-2009

Since 2003 domestic fuel price changes have played important role in accelerating and then dampening inflation in Iraq; from a prime pusher upward in 2002-2007 (acute shortages of fuel), to *the* prime puller downward, in 2008/2009 (easing of shortages). Before analyzing the role of fuel, however, let us first look into inflationary trends.

After a runaway rate of 237 percent per annum during 1990-1995, annual inflation declined to 13.6 percent in 1997-2002. Following 2002, the rate rose to 35.9% in the period 2002-2007. In 2008, inflation fell sharply to 2.7 percent and to -2.1 percent, in 2009 (Table 1).²

The main variables that usually determine the rate of inflation are: (i) domestic supply-demand gap, (ii) import prices, and (iii) inflationary expectations. To find out the relative importance of the domestic gap in Iraq, summary table (T-1) below shows that between them, rent and fuel ‘caused’ 76 percent of the 35.9 percent annual rate between 2002 and 2007. Notwithstanding imported fuel, these two items are domestically supplied. Adding to them other services in the consumer basket (e.g. transport) the influence would increase further. In the two years 2008 and 2009, these two items preserved their importance albeit with opposing directions and with higher magnitude for fuel.

Table (T-1) Contributors to inflation

	<i>Annual Inflation rate, %</i>	Contributors				
		Food	Rent	Fuel	Others	Total
1997-2002	13.6	12	64	3	21	100
2002-2007	35.9	16	50	26	9	100
2008	2.7	88	215	-219	16	100
2009 (3Q08-3Q09)	-2.0	118	166	-382	-2	-100

Source: Table (2).

The figures for rent and fuel (and for services in ‘others’), in this table, indicate that the domestic gap of supply and demand has been the main driver of inflation. This fact points at the main elements of policy that need to be implemented to reduce inflationary pressures.

¹Some of the material in this article was first discussed, online, with a group of Iraqi economists, inside and outside Iraq. Many useful comments were raised, especially those by Fadhil Mehdi.

² Except for a summary table in the text, all tables in this article are placed at the end.

At the time of the ‘explosive development’ of 1975-1980, the gap had mainly widened due to rising government spending against binding capacity constraints (absorptive capacity). The runaway inflation of 237%, per annum, in 1990-1995, was caused by widening gap between a highly constrained supply (of mainly imported goods) and demand sustained by printing money. The anatomy of inflation in that time hinged on the following:

- Supply limitations imposed by UN sanctions on imports (and oil exports), which had also constrained utilization of domestic production capacity.
- At the time of very low oil exports, the expansionary policy of money printing had led to the entrenchment of inflationary pressures and expectations in the economy.

During 2002-2007, however, the gap widened due mainly to fluctuations in supply (sometimes sharply), in their turn due to *supply shocks*. The anatomy of inflation has changed to the following:

- Supply shocks (shortages) created by insecurity, corruption/smuggling, population displacement, supply chain-disruption, and segmented markets. Supply shocks imply sharp rise in costs. The decline in agriculture and manufacturing, during this period, signifies the domestic constraints on supply.³
- Lower capacity and flexibility (incompetence), on the part of the administrative system, to identify problems and take corrective measures. For instance, in spite of persistent calls and need for additional generation/production capacities in electricity and oil refining, no timely actions were taken (e.g. the indecision to build refineries in Karbala and Nasria, SIGIR, 2007, 18).
- The weakness of the distribution fleets of the Ministry of Trade, mainly because of post-2003 looting and subsequent neglect.
- Recurring attacks on the power grid and crude oil/products’ pipelines.
- Interference of vested interests in the supply chains.⁴

II. Domestic fuel prices and inflation

Domestic fuel price variations, during 2003-2009, provide very good example of the effects of rise and fall of a supply shock. While fuel price changes enforced those of rent and food in pushing up the overall inflation rate in 2002-2007, they pulled it down (negative contribution in table T-1) in 2008 and 2009, overcoming the push-up of rent and food (positive contributions in table T-1). The result was almost zero inflation, on average, in 2008/2009. In other words, while it was a prime pusher of inflation upward in 2003-2007 it was *the* prime puller downward in 2008 and 2009. It is worth noting that the recalculation of the consumer price index using weights derived from 2007

³ Between 2002 and 2007, annual output of agriculture declined by 5.7 percent and that of manufacturing by 8.7 percent, COSIT (2009a).

⁴ IGOM (2008, 19), cites examples of such interferences; e.g. diverting the routes of oil products’ trucks.

household survey, instead of 1993's weights, has indicated stronger influence of fuel prices on inflation in all years, Table (2).⁵

II-1 The rise of a supply shock: 2003-2007

Shortages in the energy sector have appeared immediately after the fall of the old regime in 2003. To compensate for inadequate generation and transmission, the mushrooming of private power generation (generators serving small areas or single houses) and installation of small gas turbine stations, coupled with exceptional rise in number of vehicles, increased demand, tangibly, for light and middle distillates. The latter are limited in the refinery yield, leading to recurring supply crises that were only partly relieved through imports. Power cuts affected the refineries, in turn, with recurrent stoppage in refining operations.

Corruption, insecurity, and lack of capacity expansion, have all held back orderly increase, or even maintenance, of supplies to meet growing demand. Corruption in Iraq has been identified in four major areas; crude oil and oil products, public contracts, public trading organizations and government services and employment. In the oil sector, a report by the Inspector General of the Ministry of Oil (IGOM, 2006) identified seven ways or channels in smuggling and profiteering from oil in 2005; five for oil products and two for crude oil; mainly:

- i. Looting of crude and fuel oil from pipes and storages.
- ii. Overloading of crude and fuel oil in loading terminals (absence of metering and/or ineffective monitoring)⁶.
- iii. Supplying incomplete imports of oil products.
- iv. Smuggling oil products to neighbouring countries.
- v. Diverting oil products (from public entities) to the open/parallel market.

The report estimates the value of smuggled/leaked oil products for three channels, out of which we estimate a 'rent' for smugglers in the order of \$1.43 billion. We further estimate that weakness in metering might have led to smuggling of about 90 mbd of crude oil (\$1.61 billion for the whole of 2005). Together with an

⁵ The weights of the items in the consumer price index, as it is prepared now by the Central Statistical Organization, COSIT, are those of 1993. For fuel it is 2.1 percent, rent 11.5 percent and food 63.2 percent. By contrast, 2007's household survey (reported in COSIT, 2009b) shows increasing weights for fuel and rent and sharply decreasing weight for food; fuel 7.4 percent, rent 19.5, and food 35.6 percent. Using 2007's weights, our recalculation of the general consumer price index resulted in higher rates of inflation for 1997-2002, 2002-2007 and lower rates for 2008, 2009 and different contributions of constituent items, especially for fuel, see lower panel of Table (2).

⁶ The Ministry of Oil has started to install metering systems in 2007, to be completed in 2009. However, '*...at a July 2009 IAMB meeting, Iraq's Board of Supreme Audit (BSA) reported on the status of the metering program:*

- *Only 2 of the 34 meters installed on 21 North Oil Company oil sites were functional and calibrated.*
- *The Missan Oil Company had no meters installed on pipelines pumping to export terminals.*
- *The South Refinery Company did not have meters to measure outputs and inputs between depots, production departments, and beneficiaries, relying instead on radar-metering systems or other mechanisms.*
- *The Thi-Qar refinery measures oil quantities using a depth bar.*

The BSA report noted that 59 meters are required for southern refineries, but until recently, there were no letters of credit on record to purchase meters, and only 4 orders were reportedly in progress.', SIGIR (2009, 83, 84).

estimate of \$0.51 billion of imported oil products usurped before entering Iraq, then a total of about \$3.55 billion could have been the rent generated to smugglers and profiteers (from 5 out of 7-channel smuggling/profitteering) in 2005, Merza (2007).

Coupled with the lack of capacity additions, smuggling of crude oil and oil products out of the official channels (especially into the neighbouring countries) has contributed a great deal to the acute shortages in the domestic market leading to a supply shock that has fed into prices. Between June 2003 and June 2007 fuel prices increased by 59 percent per annum, Table (1).

II-2 The subsiding of the shock: June 2007-September 2009

In June 2007, official prices of oil products were raised by an average of 133 percent. For the single products, the change ranged from 100 percent for kerosene to 220 percent for Diesel (Table 3). Concurrently, average fuel price index (the average of official and open/parallel prices) rose sharply by about 188 percent between June 2006 and June 2007, Table (1).⁷ However, between June 2007 and September 2009 this index declined by about 61 percent, at the time when official prices had not fallen, Table (1). How could that happen, i.e. how could a sharp rise that exceeds official price rise, between June 2006 and June 2007, and a sharp decline with no official price fall, between June 2007 and September 2009, happen in fuel price index?

Strong evidence suggests that the main causing factors that have led to these outcomes are more to do with developments in the open/parallel market of fuel:

- i. The open/parallel market has become a major supplier of oil products and the dominant item in the consumer's fuel budget. The share of the parallel/open market in the consumer's fuel budget has risen from 52 percent in June 2006 to 72 percent as an average for 2007 (Table 3).
- ii. The confluence of raising official prices of fuel in June 2007, fighting corruption/organized crime, and lower international prices in 2009, must have reduced the motive to smuggle fuel products (especially to neighbouring countries). Consequently, domestic supplies increased⁸ and prices in the parallel/free market started to fall:
 - Prices in the open/parallel market must have come down sharply between June 2007 and September 2009. Direct observation in Iraq also suggests that such fall in open/parallel prices had taken place during this period.

⁷ The increase of official prices in June 2007 was only narrowing an already widening gap between the open/parallel and official prices.

⁸ In spite of the fact that production of oil products has not changed much, between 2007 and 2008 (according to OPEC's *Annual Statistical Bulletin 2008*, production has declined by 5.7 percent while COSIT 2009's production index of oil and chemical industries indicates a rise of 3.5 percent), improved supply conditions in 2008, must have been effected by better security, lower smuggling, and higher imports. Imports of refined oil products increased from \$1.45 billion in 2007 to \$2.37 billion in 2008 (CBI's *Annual Bulletin 2008*). Given that average crude oil price (OPEC basket) has increased from \$69 to \$94/barrel, this implies that quantity of imports increased from 57 TBD to 69 TBD, an increase of 19 percent.

- Together with the high share of the open/parallel market, in average consumer's fuel budget, this fall must have been the major factor in the fall of fuel average price index, which amounted to about 61% between June 2007 and September 2009 (Table 1).

III. Supply conditions and demand management

III-1 Supply and demand

The domestic gap is influenced by supply as much as by demand of goods and services. Therefore, analyses and policy recommendations need to tackle both. One, however, needs to pay attention to a fundamental fact now in Iraq that prevailing conditions (insecurity, violence, corruption, population displacement, etc.) have created series of supply shocks, which in turn caused domestic supply system to operate much below its capacity frontiers (trend), in addition to the segmentation of markets. During 2003-2007, and even now, the supply curves of many goods and services have become much higher than in more normal conditions. Example: fuel supply curve starts as a straight line then rises up at a slope commensurate with the severity of fuel shortages; i.e. a segmentation of official and parallel/open supply curves.

When utilization or supplies are much below frontiers, measures aimed at relieving (or worsening) the supply conditions, lead to dramatic change in the inflation rate, as demonstrated above. Supply shocks, on the other hand, could render demand management somewhat an ineffective/inefficient policy tool. To reduce inflation, demand management, reads demand reduction, is well suited to a situation where the economy is operating at or near its production (supply) frontiers. In this case, expanding the frontiers is very hard; therefore, there is no other way but to reduce demand in order to reduce inflation. When the economy is far below its frontiers, supply policies are more relevant.

III-2 Demand management, monetary policy, and inflation

According to an influential view (IMF, 2008a), falling from an annual rate of 32 percent in 2006 to 19 percent in 2007 to 12 percent in the first quarter of 2008, lower *core* (i.e. non-fuel) inflation (Table 1), was due to:

- Appreciating rate of exchange.
- Tightening monetary policy through higher interest rate and higher reserves requirements with the Central Bank.
- Controlling current government spending.

To evaluate this view, in the light of our hypothesis that supply shocks render demand management largely ineffective, and also to extend the period under consideration to September 2009, let us consider the following:

1. Aggregate demand, in Iraq, is mainly determined by the budget (along with household's, and soon oil companies' spending). The central bank's role is constrained. Neither the interest rate nor the financial markets are ready yet

for the central bank to have an important leverage. Even in more developed financial markets in other oil-producing countries the ever present fact is that the government controls the tap (oil revenues, and also when borrowing from the financial system). I.e. in the end, the budget largely determines money supply.

2. Now, At the time when average annual government (budget) spending was ID47 trillion in 2004-2007, annual core (non-fuel) inflation rate was 29 percent, but when spending jumped to an annual average of ID75 trillion in 2008/2009, annual core inflation fell to 10 percent (Tables 1, 4). This indicates clearly that inflation was not affected much by government spending.
3. By checking demand, theory suggests, that higher interest rate reduces pressures on prices.⁹ For Iraq, it seems that the above-mentioned view envisages that the effectiveness of tighter monetary policy (i.e. high interest rate and reserve requirements) was achieved directly by affecting demand and/or (with the appreciation of the ID against the US\$) through de-Dollarization. But has the raising of interest rate, and reserve requirements between 2005 and 2007, imposed an important brake on demand? Some practitioners claim that banks had, largely, moved their idle balances to the Central Bank in order to earn return; otherwise these balances would have remained idle, i.e. not affecting demand. Kurdistan could have been a different storey, though.
4. As for household/private demand, it is more likely that insecurity and uncertainty, which resulted in constrained investment opportunities, have held back economic activity more than higher interest rate. Two categories of demand have been at play. The first includes that largely operating in cash-based economy (mainly informal economy). This category is hardly sensitive to interest rate changes. As for the second; mainly those keeping accounts in banks, it is true that interest rates were high enough for them to keep money there. It is equally feasible to argue, however, that high bank accounts were mainly due to lack of viable investment opportunities as much as high interest rate.
5. On the side of influencing the components of the consumer price index, the effectiveness of monetary policy/demand management seems more doubtful. It is clear from the above that monetary tightening could not have

⁹ Because of higher cost of borrowing, higher interest rate is supposed to check demand for loans and hence for goods and services (consumer durables/housing and investment), thus reducing economic activity (weaker demand-pull). Higher interest rate also means lower shares' prices and, through the '*wealth-effect*', lower demand for goods and services. Lower economic activity, in turn, implies lower demand for labour. This puts a lid on wage increases and hence checks inflation through the cost side (weaker cost-push). Furthermore, higher interest rate may also lead to lower inflationary expectations.

had an effect in domestic fuel markets (i.e. fuel price index). Furthermore, food availability, and hence food price index, is mainly governed by supply conditions; domestic and/or imports. Therefore, what remains for monetary tightening/demand management is rent (the other items, as shown in table T-1, were not that important). Has tightening reduced possible speculation in the real-estate market such that it prevented the rent from rising further in 2008 and 2009? The rent index rose by 14.7 percent in 2008 (when the central bank's policy rate of interest was 17 percent) and by 7.4 percent in 2009 (when the interest came down to 10 percent, January-September). This is hardly the intended influence expected from such change in the interest rate, and hence from monetary tightening.

6. Thus, it is difficult to substantiate the afore-mentioned view empirically. Supply shocks prevent genuine (non-spurious) estimation of the influence of demand variables. Our conviction, therefore, is that monetary tightening has been a good tool in maintaining the *credibility* of the central bank and in supporting its stance not to let money supply get out of hand, therefore, precipitating the kind of runaway inflation that prevailed in 1990-1995. But until more credible evidence suggests otherwise, our analysis has shown that monetary tightening had no palpable influence on inflation during 2003-2009.

IV. Recommendations

At this stage/time, the main recommendations for policy on inflation are:

- i. Improving and maintaining security.
- ii. Fight corruption and organized crime.
- iii. Instate competent personnel in public administration.
- iv. Enforce credible and professional economic management.
- v. Target shortages and ease absorptive capacity constraints.
- vi. Avoid administrative pricing but keep watchful eye on the supply chain.
- vii. Encourage healthy private sector away from monopolies, interest groups, and political cronies.
- viii. Adopt well-prepared five-year plan/investment programme to streamline ongoing and add new projects in power generation and transmission, oil refining and pipelines, and the infrastructure.
- ix. Given its limited role in influencing demand, and until such time when monetary tools had developed and financial markets deepened, the central bank can influence inflation, by:
 - Influencing inflationary expectations, mainly through maintaining stability and credibility of its policies.
 - When relevant, influencing import prices through its rate of exchange policy.

- Continuing with the development of monetary tools and deepening of financial intermediation.
- x. Protect the exposed from inflation through maintaining strong, inclusive, and adequate safety net.

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*Dr Merza has worked for the Iraqi Ministries of Oil and Planning and for the UN Department of Economic and Social Affairs.
E-mail address: merza.ali@gmail.com*

Table (1): Domestic Fuel Prices and Inflation

	Consumer Price Index, 1993=100						Rate of Exchange, Iraqi Dinars for one US\$
	General Index	Annual Rate of Change, %	Fuel and Light	Annual Rate of Change, %	Core Inflation: Index Excluding Fuel	Annual Rate of Change, %	
1990	6						4
1991	18	187.0					10
1992	33	83.8					21
1993	100	207.5	100.0				74
1994	548	448.5	536	436.2	549		458
1995	2,672	387.1	3,237	503.7	2,695	391.2	1,674
1996	2,242	-16.1	3,890	20.2	2,221	-17.6	1,170
1997	2,759	23.1	5,428	39.6	2,701	21.6	1,471
1998	3,167	14.8	6,769	24.7	3,090	14.4	1,620
1999	3,565	12.6	10,565	56.1	3,370	9.0	1,972
2000	3,743	5.0	9,481	-10.3	3,553	5.4	1,930
2001	4,355	16.4	9,334	-1.6	4,202	18.2	1,929
2002	5,219	19.8	9,279	-0.6	5,134	22.2	1,957
2003	7,174	37.5	49,011	428.2	6,277	22.3	1,936
2004	8,816	22.9	32,227	-34.2	8,378	33.5	1,453
2005	12,074	37.0	64,161	99.1	10,959	30.8	1,469
2006	18,501	53.2	183,515	186.0	14,432	31.7	1,467
2007	24,206	30.8	314,864	71.6	17,214	19.3	1,255
2008	24,851	2.7	247,455	-21.4	19,454	13.0	1,194
2009: 3 Quarters	24,074	-2.0	159,038	-35.4	20,648	7.6	1,170
<i>Average (Annual Rate)</i>							
1990-1995		236.8					
1997-2002		13.6		11.3		13.7	
2002-2007		35.9		102.4		27.4	
2007-2009: 3Q07-3Q09		-0.4		-30.4		10.3	

Sources:

Ministry of Planning, Central Organization for Statistics and Information Technology (COSIT), *Consumer Price Index*,

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Annual Bulletins 2003-2008.

Table (2) Contributors to inflation

	Annual Inflation rate, %	Contributors				
		Food	Rent	Fuel	Others	Total
<i>1993's weights</i>		63.2	11.5	2.1	23.2	100
1997-2002	13.6	12	64	3	21	100
2002-2007	35.9	16	50	26	9	100
2008	2.7	88	215	-219	16	100
2009 (3Q08-3Q09)	-2.0	118	166	-382	-2	-100
<i>2007's weights</i>		35.6	19.5	7.4	37.4	100
1997-2002	19.1	6	64	5	25	100
2002-2007	48.7	5	51	33	11	100
2008	-4.3	15	111	-235	9	-100
2009 (3Q08-3Q09)	-10.2	7	28	-136	1	-100

Sources:

(1) Figures in the table are calculated from detailed annual and monthly figures for consumer price index according to the indicated weights. See sources in table (1) above.

(2) Weights of 2007 are from COSIT (2009b).

Note: Figures in shaded cells refer to the weights of the items in the consumer's budget (basket). For each set of weights (1993, 2007), figures in the other cells refer to the contributions of items to the overall inflation rate (as shown in the left column). The contribution of each item is a function of, mainly, (i) its weight, and (ii) relative change of its price (i.e. its inflation rate).

Table (3) Average Monthly Fuel Consumption

	Gasoline	Diesel	Kerosene	LPG	
Quantities consumed monthly by average household, 2005					
	<i>Liter</i>	<i>Liter</i>	<i>Liter</i>	<i>12kg-Cylinder</i>	
Official	107.4	7.4	13.1	0.4	
Open/Parallel	31.5	4.3	12.6	2.2	
Total	138.9	11.7	25.7	2.6	
Quantity shares in household's consumption 2005 , %					
Official	77.3	63.2	51	14.9	
Open/Parallel	22.7	36.8	49	85.1	
Total	100.0	100.0	100.0	100.0	
Prices					
	<i>ID/Liter</i>	<i>ID/Liter</i>	<i>ID/Liter</i>	<i>ID/12kg-cylinder</i>	
Official Price in June 2006	175	125	75	1000	
Official Price in June 2007	400	400	150	3000	
Average household's monthly spending on fuel products, June 2006, 1000 ID					Total
Official	18.8	0.9	1.0	0.4	21.1
Open/Parallel	12.6	1.7	1.9	6.6	22.8
Total	31.4	2.6	2.9	7.0	43.9
Value shares in household's budget, June 2006 , %					Average
Official	59.9	35.0	34.2	5.7	48.1
Open/Parallel	40.1	65.0	65.8	94.3	51.9
Total	100.0	100.0	100.0	100.0	100.0
Average household's monthly spending on fuel products, 2007, 1000 ID					Total
Official	9.3	2.0	5.0	3.1	19.5
Open/Parallel	19.4	4.8	12.9	12.0	49.0
Total	28.7	6.8	17.9	15.2	68.5
Value shares in household's budget, average 2007 , %					Average
Official	32.5	29.6	28.2	20.7	28.5
Open/Parallel	67.5	70.4	71.8	79.3	71.5
Total	100.0	100.0	100.0	100.0	100.0

Sources: calculated on the basis of figures from:

Central Organization for Statistics and Information Technology, COSIT, (2006) *Survey of Living Conditions in Iraq 2005* ,

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IMF (2008a, 35).

Table (4): The Budget, Billion Dinars

	Actual					Budget 2009
	2004	2005	2006	2007	2008	
Revenues	29,783	49,470	58,347	58,715	86,351	50,408
<i>Oil</i>	25,907	35,352	47,347	52,878	79,000	
<i>Nonoil (including grants, except for 2009)</i>	3,876	14,118	11,000	5,837	7,351	
Expenditures	45,202	46,478	50,351	48,154	77,707	89,038
<i>Current</i>	36,888	37,333	38,025	38,333	58,283	54,148
<i>Investment</i>	8,314	9,145	12,317	9,337	19,301	15,017
<i>Governorates</i>						2,872
Contingency	0	0	9	484	123	17,000
<i>Expenditures excluding contingency</i>	45,202	46,478	50,342	47,670	77,584	72,038
Balance (excluding contingency)	-15,419	2,992	8,005	11,045	8,767	-21,629

Sources:

2004-2007: IMF (2008b).

2008: Central Bank of Iraq, CBI, *Annual Bulletin 2008*, and IMF (2008b).

2009: Council of Representatives (2009) *Federal Budget Law for 2009* ,

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Note: Figures for expenditures (current and investment) in this table, for 2004-2008, are mainly based on IMF (2008b). Total expenditures in this source are much higher than those appearing in the annual bulletins of the central bank. Total expenditures in those bulletins are close to the current expenditures in the IMF figures.