

Political Economy of Oil and its Implications for India

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ABSTRACT

Oil is so precious for human civilisation that it influences development and, thereby, drives economies in a big way as it is one of the most important sources of energy and is a key input for industries. Oil has provoked political as well as economic tug-of-war between the developed countries - the largest consumers, and the OPEC countries - the largest producers. This, fight-fight situation monopolistic and monopsonistic forces have been the key factors for determining the price of oil. In recent times, emergence of some Asian countries as major consumers of oil has changed the global oil-based economic and political scenario. It has been deduced here that in a bilateral monopoly market between OPEC and DCs, the side which has less elasticity, will have lesser surplus. But, in a cartel monopoly market, the situation gets worse as there is no force to pressurise the supply side. Besides the economic factors, there are also certain non-economic factors, which cannot be quantified. These have been explained using game theory.

India is a heavy importer of oil with 70% of its oil demand being met through imports. Therefore, international activities influence the economic scene of India in big way. In fact, a rise in oil prices lead to inflation in India's domestic market, which also influences India's business cycle and has serious long-run implications for the consumers and the economy as a whole. Also, because India is a heavy importer, it has various oil policies. A case study has been included to find out exactly how transparent they are. A model has been formulated to illustrate whether a reduction in taxes is feasible or not and the ways in which such reduction may be done without hurting the economy. Finally, the paper winds up with some long-run remedies that will increase the welfare of the country in the time to come.

Key words : oil price, OPEC, developed countries, Asian economies, inflation, business cycle, trade, bilateral monopoly, cartel monopoly, game theory, Indian policies, renewable sources of energy.

1 - Introduction

Petroleum, popularly known as oil, is so important to human civilisation. It is grouped under fossil-based source of energy and is available in very restricted areas of the earth's crust. It is so very precious to human development that it is rightly called the 'Liquid Gold'. It is so power-packed as a source of energy that it has become the centre of controversy, politics and money. It has brought joy as well sorrow to mankind over years - has earned immense amount of wealth for some and loss of dear ones in wars for others.

a) Economic & political importance of oil

1. Oil is a crucial source of power for industries and continual and uninterrupted supply is essential as it is constantly consumed. This makes the industrial DCs especially vulnerable.
2. It is an ideal raw material for energy demand of industries as it is available in large amounts in quite a number of places and its production costs are less than exploiting other energy sources.
3. Oil is an exquisite item of trade as it is constantly consumed and thus demand is always guaranteed for the producers.
4. Supply and price of oil drives national economies, mainly by heavily influencing their inflation rates, and therefore their business cycles.
5. Oil also has effects on the balance of payments of nations and exchange rates of global currencies.
6. It is the most important source of income for the major oil producing nations who have little or no other economic source to contribute to their national GDP.
7. Price and supply of oil directly affects the masses of the consumer countries who mostly use this source of energy for conducting various activities in their daily lives.

b) Availability of oil and vulnerability of DCs

Oil is available in only a few countries of the world. But, it is a key input for almost all industries in the world. Thus, a continuous supply of this source of energy is absolutely essential for industry to thrive.

The industrial sector is the most important sector in all the developed countries. But, very few developed countries are naturally endowed with this particular resource. Thus, they have to import their entire requirement of oil. And, since, the availability of oil is concentrated in only a few nations, these industrial DCs become very heavily dependant on the oil exporters.

The vulnerability of the DCs can be attributed to 3 basic factors :

1. Percentage of DC imports from the top 5 suppliers of the world : The top 5 global oil suppliers are Saudi Arabia, former USSR, Norway, Venezuela and Mexico who are responsible for meeting the oil demand of a large part of the DCs. Thus, the degree of vulnerability of a particular DC depends on the amount of oil it imports from these countries. Here, the degree of dependence is regional as nations having very close trade ties with these 5 countries will be more dependent on them than other nations of the world. For example, degree of dependence of the US has gone up from 62% in 2001 to 76% in 2002.

2. OPEC share of world petroleum supply : The countries of the Middle East are naturally endowed with large reserves of oil. Thus, to prevent competition between them which would result in lowering of prices, they came together and formed a cartel, OPEC, along with 4 other developing countries. And, by forming a cartel monopoly, they started trying to capture as much of the market as possible. Thus, the share of market controlled by OPEC also gives a measure of the degree of dependence of the DCs.

3. Persian Gulf share of world petroleum supply : The Persian Gulf region is historically politically unstable. In fact, it has been house to 3 crises in the recent times. Thus, imports from this region are pretty insecure. And, as the DCs need uninterrupted supply of oil for proper functioning of their industries, such insecurity makes them pretty vulnerable.

II – International scenario

a) Factors determining the price of oil

1. *Increase in international demand* - High rate of economic growth in Europe and Asia, especially in Brazil, Russia, India and China, popularly known as BRIC, gives rise to a large increase in global demand. But, the supply does not rise so dramatically and it also gets disrupted sometimes due to non-availability of spare oil and political instability. Thus, the price of oil rises. Therefore, the supply-demand balance is a very important factor in determining the price of oil.
2. *Uncertainty of oil supply* - Crude oil is refined to petrol and diesel before being exported. This process takes 60-90 days on an average and it takes a further 4-6 weeks at least to deliver the supply to the consumer countries. And, since, there is a shortage of refineries, supply becomes very uncertain. This pushes up prices. Sometimes, political volatility further adds to this uncertainty.
3. *Inelasticity of oil demand in the short-run* - Due to the fact that availability of oil is concentrated in a few countries and demand is rising due to rapidly rising global industrialisation, demand of oil is pretty inelastic in the short-run. This leads to strong price movements in the market.
4. *Taxation* - This takes up a significant part of the price throughout the world. As the rate of taxes go up, the price too will go up.
5. *Role of expectations* - As economic growth happens, it is expected that the demand will go up and excess demand is expected to appear. Thus, the expected price escalates. Therefore, higher the rate of economic growth, higher will be the expected price of oil.
6. *Role of US Dollar* - Oil is internationally traded in US dollar as a single currency system lowers transaction costs. As the dollar weakens, oil

becomes cheaper for other foreign consumers and so their demand rises.

7. *Inventories and strategic storage* - When inventories of oil build up in the producing countries, the price is lowered to enable clearance of the inventories.
8. *Geopolitical risks* - Various political events also influence oil price. Some of the major political problems encountered in recent times are terrorist attacks in Iraq, violence of rebel groups in Nigeria, nuclear issues of Iran, political instability of Venezuela and oil nationalism in Russia.

b) International politics

A - OPEC takes advantage of price inelasticity :

According to the President of OPEC, the organisation does not need to increase production now as a rise in supply will not affect the price because currently demand and supply are in balance.

This is a surprising statement as obviously the OPEC is not unaware of the relationship between price and quantity. But, rather the statement shows that the suppliers are very much aware of the inelasticity of demand, especially of the industrial developed countries, and thus try their best to take as much advantage as possible of the pretty inelastic demand curve.

A simple statistic illustrates exactly how inelastic demand of the DCs is. In the USA, which is the largest global consumer, when price goes up by 25%, demand falls by only 0.2%. And, the situation is not much different for the other DCs.

B - The corrupting influence of oil :

As price of oil rises, the exporting countries start earning larger profits. This induces over-regulation by their domestic governments. Also, taxation rises and bribe-seeking goes up. Therefore, to protect themselves, transparency in the industries go down. This leads to a fall in investment and the future output is affected.

C - Bilateral Monopoly :

The global supply of oil is mainly controlled by the OPEC countries, although other countries, like Russia, also produce oil. And though the entire world consume oil, the major global consumers are the industrial developed countries.

Therefore, in our model we assume that the OPEC is trying to exert monopoly power in the market and the OECD countries are trying to exert monopsony power over the OPEC. Thus, we get a situation of bilateral monopoly here.

MODEL - 1

- Assumptions :**
- 1) The demand curve facing the monopolist is -
 $AR = a - bQ$
 - 2) The supply curve facing the monopsonist is -
 $AE = c + dQ$

Therefore,

$$TR = aQ - bQ^2$$
$$MR = a - 2bQ$$

And,

$$TE = cQ + dQ^2$$
$$ME = c + 2dQ$$

For the monopolist :

Equilibrium condition is:

$$MR = \text{Supply curve} = AE$$

Substituting the values we get,

$$a - 2bQ = c + dQ$$
$$\Rightarrow Q_{MP}^* = \frac{a-c}{2b+d}$$

This is the monopolist's equilibrium quantity.

To get the equilibrium price, we substitute the value of the equilibrium quantity in the demand function.

$$AR = P = a - bQ_{MP}^*$$

$$\Rightarrow P = a - b \left\{ \frac{a-c}{2b+d} \right\}$$

$$\Rightarrow P_{MP}^* = \frac{ab+ad+bc}{2b+d}$$

This is the monopolist's equilibrium price.

For the monopsonist :

Equilibrium condition is :

$$\mathbf{ME = Demand\ curve = AR}$$

Substituting the values we get,

$$c + dQ = a - bQ$$

$$\Rightarrow Q_{MS}^* = \frac{a-c}{b+2d}$$

This is the monopsonist's equilibrium quantity.

To get the equilibrium price, we substitute the value of the equilibrium quantity in the supply function.

$$AE = P = c + dQ_{MS}^*$$

$$\Rightarrow P = c + d \left\{ \frac{a-c}{b+2d} \right\}$$

$$\Rightarrow P_{MS}^* = \frac{cd+bc+ad}{b+2d}$$

This is the monopsonist's equilibrium price.

Let us now compute the equilibrium price-quantity combination that would have prevailed if OPEC and the OECD countries did not try to exert any kind of influence and let demand and supply balance each other. This situation is similar to a perfectly competitive market.

In a perfectly competitive market :

Equilibrium condition is : Demand = Supply

Substituting the values we get,

$$a - bQ = c + dQ$$

$$\Rightarrow Q_C^* = \frac{a-c}{b+d}$$

This is the equilibrium quantity in a perfectly competitive market.

To get the equilibrium price, we substitute the value of the equilibrium quantity in the demand function.

$$P = \text{Demand} = a - bQ_C^*$$

$$\Rightarrow P = a - b \left\{ \frac{a-c}{b+d} \right\}$$

$$\Rightarrow P_C^* = \frac{ad+bc}{b+d}$$

This is the equilibrium price in a perfectly competitive market.

From here, the producer's surplus (PS) under monopoly and the consumer's surplus (CS) under monopsony can be computed.

Producer's surplus under monopoly is,

$$PS = (P_{MP} - P_C) Q_{MP}$$

$$= \left(\frac{ab+ad+bc}{2b+d} - \frac{ad+bc}{b+d} \right) \left(\frac{a-c}{2b+d} \right)$$

$$= \frac{a^2b^2 - 2ab^2c + b^2c^2}{(b+d)(2b+d)^2}$$

$$= \frac{b^2}{(2b+d)^2} \frac{(a-c)^2}{b+d}$$

Consumer's surplus under monoposony is,

$$\begin{aligned}
 CS &= (P_C - P_{MS}) Q_{MS} \\
 &= \left(\frac{ad+bc}{b+d} - \frac{cd+bc+ad}{b+2d} \right) \left(\frac{a-c}{b+2d} \right) \\
 &= \frac{a^2d^2 - 2acd^2 + c^2d^2}{(b+d)(b+2d)^2} \\
 &= \frac{d^2}{(b+2d)^2} \frac{(a-c)^2}{b+d}
 \end{aligned}$$

OBSERVATION 1 :

The price under perfectly competitive market lies in between the prices under monopoly and monoposony.

$$\begin{aligned}
 P_{MP} - P_C &= \frac{ab+ad+bc}{2b+d} - \frac{ad+bc}{b+d} \\
 &= \frac{b^2(a-c)}{(2b+d)(b+d)} > 0
 \end{aligned}$$

$$\begin{aligned}
 P_C - P_{MS} &= \frac{ad+bc}{b+d} - \frac{cd+bc+ad}{b+2d} \\
 &= \frac{d^2(a-c)}{(b+2d)(b+d)} > 0
 \end{aligned}$$

Therefore, it is proved that :

$$P_{MP} > P_C > P_{MS}$$

OBSERVATION 2 :

The quantity produced under a perfectly competitive market is higher than those under monopoly as well as monopsony.

$$\begin{aligned}Q_C - Q_{MS} &= \frac{a-c}{b+d} - \frac{a-c}{b+2d} \\ &= \frac{d(a-c)}{(b+d)(b+2d)} > 0\end{aligned}$$

$$\begin{aligned}Q_C - Q_{MP} &= \frac{a-c}{b+d} - \frac{a-c}{2b+d} \\ &= \frac{b(a-c)}{(b+d)(2b+d)} > 0\end{aligned}$$

Therefore, it is proved that :

$$Q_C > Q_{MP} \text{ and } Q_C > Q_{MS}$$

OBSERVATION 3 :

The amount of PS and CS will depend on the price elasticities of the demand and supply curves.

Absolute slope of the demand curve or the AR curve = b

Absolute slope of the supply curve or the AE curve = d

When, AR is steeper than AE, i.e, $b > d$, then, the demand curve is more inelastic than the supply curve.

In this case, $b > d$

$$\Rightarrow b^2 + 2bd > d^2 + 2bd$$

$$\Rightarrow \frac{b}{2b+d} > \frac{d}{b+2d}$$

$$\Rightarrow \frac{b^2}{(2b+d)^2} > \frac{d^2}{(b+2d)^2}$$

$$\Rightarrow \frac{b^2}{(2b+d)^2} \frac{(a-c)^2}{(b+d)} > \frac{d^2}{(b+2d)^2} \frac{(a-c)^2}{(b+d)}$$

$$\Rightarrow PS > CS$$

Thus, when demand is more inelastic, the producer gains more than the consumer.

Similarly, when AR is flatter than AE, i.e., $b < d$, then the demand curve is more elastic than the supply curve. In this case, $PS < CS$. Thus, here, the consumer gains more than the producer.

Therefore, it is proved that the price elasticities of the two curves determine which party will gain more.

D- Cartel Monopoly :

In present world, the model of bilateral monopoly may not be always applicable because of the emergence of many Asian economies. In fact, the growth rates of India and China have also been blamed for the hike in the oil prices by many of the developed countries. Definitely, it cannot, therefore, be said anymore that the developed countries are always able to exert a monopsony power. It is more appropriate to say that the market from the demand side has opened up, with OPEC still holding monopoly power over the supply side. Thus, this is a case of cartel monopoly.

MODEL - 2

Let the cost incurred for rigging of crude oil and refining it be :

$$P_O Q_M$$

Therefore, total variable cost is :

$$TVC = P_O Q_M + \beta Q_M^2$$

where β = rate of change of MC, $\beta > 0$

Therefore, the total cost is :

$$TC = P_O Q_M + \beta Q_M^2 + TFC$$

$$TFC > 0$$

Total revenue is :

$$TR = P_M Q_M$$

Let us assume that the demand function is a linear one. Therefore the demand function is :

$$P_M = AR = a - b Q_M$$

$$a, b > 0$$

Therefore,

$$TR = (a - bQ_M) Q_M$$

The first order condition for profit maximisation is :

$$MR = MC$$

$$\Rightarrow a - 2bQ_M = P_0 + 2\beta Q_M$$

$$\Rightarrow Q_M^* = \frac{a - P_0}{2\beta + 2b}$$

This is the equilibrium quantity.

The second order condition for profit maximisation is :

$$\text{Slope of MR} < \text{Slope of MC}$$

Here,

$$\text{Slope of MR} = - 2b,$$

$$\text{Slope of MC} = 2\beta.$$

Therefore, profit is maximised.

Substituting the equilibrium quantity into the demand function, we get :

$$\begin{aligned} P_M^* &= a - bQ_M^* \\ &= \frac{2a\beta + ab + bP_0}{2\beta + 2b} \end{aligned}$$

This is the equilibrium price.

The total revenue earned is :

$$\begin{aligned} TR_M^* &= P_M^* Q_M^* \\ &= \frac{2a^2\beta - 2a\beta P_0 + a^2b - bP_0^2}{(2\beta + 2b)^2} \end{aligned}$$

The total cost incurred is :

$$\begin{aligned} TC_M^* &= P_0 Q_M^* + \beta Q_M^{*2} + TFC \\ &= \frac{aP_0 - P_0^2}{2\beta + 2b} + TFC \end{aligned}$$

Therefore, the profit is :

$$\pi_M^* = \frac{2a^2\beta - 4a\beta P_0 + a^2b - 2abP_0 - aP_0^2 + 2\beta P_0^2 + 2bP_0^2}{(2\beta + 2b)^2} - TFC$$

OBSERVATION:

In this case, the monopolist's power will be higher than in the case of bilateral monopoly. In the previous case, the two powers will negotiate and reach a price that will be in between P_{MP}^* and P_{MS}^* . Here, OPEC will be exerting full monopoly power and will be setting price at P_M^* . Therefore, in a way, this situation is more serious than the previous one.

E- Non-economic Factors :

Price of oil is not always determined by economic factors only as is suggested by the two above models. There are various non-economic factors that influence pricing decisions. Political factors, some of which have already been discussed, are also very important. Besides these, there are certain psychological factors, like fear of America's military strength or religious considerations, which play an important role. But, these factors cannot be quantified. Thus, we are attempting to explain them using game theory.

MODEL - 3

In this game, fighting, i.e., OPEC's trying to raise price or DCs' pressuring to lower prices, gives a payoff of 1. And, yielding, i.e., letting the other party exert its power, gives a payoff of 0.

GAME 1:

Let the OPEC be more powerful. Then, in the fight-fight cell, OPEC will have a payoff of 1 and the DCs will have a payoff of -1.

		OPEC	
		Fight	Yield
DCs	Fight	(1, -1)	(0, 1)
	Yield	(1, 0)	(0, 0)

Here, irrespective of what the DCs do, OPEC will fight, i.e., will hike price as much as possible. And, when OPEC fights, the optimal reaction of the DCs is to yield. Thus, the Nash equilibrium will be (Fight, Yield).

GAME 2:

Let the DCs be more powerful. Then, in the fight-fight cell, OPEC will have a payoff of -1 and the DCs will have a payoff of 1.

		OPEC	
		Fight	Yield
DCs	Fight	(-1, 1)	(0, 1)
	Yield	(1, 0)	(0, 0)

Here, irrespective of what the OPEC does, DCs will fight, i.e., will pressurise OPEC to lower price as much as possible. And, when DCs fight, the optimal reaction of OPEC is to yield. Thus, the Nash equilibrium will be (Yield, Fight).

DISCUSSIONS :

The simplest form of game theory is resorted to in this model in order to make an idea about the basic process of human judgment. Human brain makes judgment and decisions in somewhat similar manner. But, curiously, even the most complex forms of game theory and other forms of mathematics, have failed to understand human behaviour, including its decision-making. And, therefore, mathematical interpretations and predictions, more often than not, do not tally with reality. Economists and philosophers have recognised that complex mathematics, like Nash Bargain Game and other Bargaining Solutions, Evolutionary game theory, etc. are not, adequate to detail human attitude towards distributive justice.

Economists and scientists have, now-a-days, realised that such mathematics are not adequate alone to appreciate the wonderland of human thought process. Firing of millions of neurons for a miniscule decision, cannot be appreciated unless the models and tasks of Game Theory with modern psychological and neuroscientific methods are combined. A new branch of economics is emerging - named 'neuroeconomics'. Social exchange, affecting brain's regard system, the affective factors, assessment of intentions, etc., are a few of the multitude of factors involved in complex decision making in competitive and bargaining games.

In oil bargaining game between OPEC and developed countries in particular, involves such psycho-social factors, which are non-quantifiable by mathematical formulae and equations. Factors like, defiance against western arrogance, fear of American military might,

apprehension of western invasion of countries' sovereignty, age-old Islam-Christianity conflict - all these lead to a fight-fight situation between OPEC and industrialised countries of the west. These factors provoke OPEC countries to raise oil price to an abnormally high level. But, factors like, inability of low developed Islamic brothers to pay high price, urge to avoid direct conflict with western world - particularly with America, responsibility of friendship with some low developed countries (like Iran-India), apprehension of losing large business from rapidly developing countries (like India, China), etc. - all pull them from their back to go ahead with abnormal price rise. The price of oil is, therefore, fixed at a somewhat compromising mid-level - the reason of which cannot be fully clarified by mathematics alone. America can afford perhaps 200\$ a barrel. Whereas, perhaps, 50\$ a barrel would have been sufficient for the OPEC countries. But, oil price is finally fixed at 110-120\$ a barrel due to such innumerable humane considerations, which are beyond the scope of raw mathematics, but are subject matter of the recently emerging science of 'neuroeconomics'.

III - Indian scenario

a) Volume of trade of oil in India

India imported about US\$ 52112.74 million worth of crude oil and other petroleum products in 2006-07. This makes up about 70% of the total energy requirement of India and the oil bill constitutes about one-third of the country's total import bill. (India charges an import tax of 5% on crude oil.) Thus, India is a heavy importer of crude oil and other products.

India exported about US\$ 16889.83 million worth of crude oil and other petroleum products in 2006-07. And, according to reports, the value of oil exports has fallen marginally in the current year.

It has been found that in the current year demand for oil has gone up by 3.8% and the amount of imports has risen by 23.3%. But, in spite of this increase, India consumes only about 3% of the total global oil consumption, although this figure is rapidly rising.

b) Indian political scene - Policies and Taxation

India's oil policies can easily be termed a "Pandora's box" as none of the common people are aware of exactly which taxes and duties go into the determination of oil prices in the Indian domestic market.

Reports suggest that oil firms make windfall profits while the costs are passed onto the ultimate consumers. And, the unsuspecting masses are told that the steep price hike is due to the rising prices of other essential goods. Although, here, it must be stated that because of certain political ends, the Govt. never really tries to pass on the entire price burden onto the ultimate consumers, even if it implies an additional fiscal burden for the Govt.

The govt. also gives subsidies on oil products. Kerosene, which is mainly consumed by people having very low incomes, is heavily subsidised. Diesel is subsidised at Rs. 25 per litre and subsidy given on petrol is Rs. 15-17 per litre.

But, the govt. also imposes taxes on the consumption of oil. A central excise duty that is imposed has run into rough weather with certain sections of the political fraternity demanding a cut in the amount of duty imposed.

Also, the VAT imposed is around 30% for most Indian states (27.66% in West Bengal). This has also not gone down well with certain sections of the political fraternity who are of the opinion that a cut of around 7% will not make anybody in the economy worse off. In fact, it will make the ultimate consumers better off.

There are certain interesting facts that show exactly how transparent oil policies are India :

1. In India, the more widely used petrol is priced higher than the lesser-used diesel. For the rest of the world, the opposite holds true
2. Indian petrol consumers pay a higher price than even the consumers of petrol in the US. Also, the price of petrol in India - US\$ 1.17 per litre, is the costliest among all developing countries.
3. Under-recoveries or subsidies are mixed up with actual loss to confuse people.

4. A 5% GDP loss is claimed to be due to the oil subsidies. But, in reality, this loss is never actually observed. This is because, the Govt. gives a subsidy on produced oil and sells it at a lower price. Then, oil bonds are sold to make up some of the difference. Thus, at the end, no one really knows whether it's a tax or a subsidy or how much it is costing the nation.

Table : 1

The table given below supports the above facts :

Item	Consumption (MMT)	International oil prices at		Indian price 6-Jun-08 Rs/Litre	Tax/Subsidy Rs '000 crore	
		\$80/barrel Rs/Litre	\$130/barrel Rs/Litre		\$80/barrel	\$130/barrel
Kerosene	10	24	39	25	1000	-14000
LPG	11	17	27	25	8800	-2200
Diesel	48	26	42	36	48000	-28800
Petrol	10	22	35	55	33000	-20000
Total					90800	-25000

Also, it is observed that there is an overwhelming concern for raising supply while there is practically no demand management. The argument made to support this behaviour is that as a large part of the Indian population still do not have any access to energy, it is only rational that the supply side be concentrated upon. But, on further investigating the case, it is found that since most energy decisions are influenced by the energy supply organisations, the demand side lies in utter neglect.

c) Effects of price rise and other international activities on the Indian economy

India is a heavy importer of oil. Almost 70% of India's oil requirements are met through imports. Thus, due to this heavy dependence, global trends and activities heavily influence India's oil policy. And, being an importer, any kind of price movements have very important implications for the Indian economy.

As import price of crude oil rises, it becomes very difficult to restrict domestic prices as doing so would

endanger the survival of the state-owned oil firms. And, this would lead to a crash in the economy. On the other hand, if the Govt. tries to restrict price from rising and yet prevent a crash, then that would imply a large fiscal burden for the Govt. Thus, if oil prices go up globally, then domestic price also has to follow suit.

But, the major problem that surfaces due to a domestic price rise, is inflation. This is because, as oil is a key input for domestic industries, a rise in its price would mean rising production costs, and this would get reflected as higher prices for final goods. This phenomenon is also known as secondary price effect and it makes things difficult for the ultimate consumers, especially since India is home to one-third of the world's poor.

Besides making goods more expensive, inflation also has another serious effect. The price rise during times of inflation results in a fall in the real income of the economy. This leads to a fall in the demand for goods. So, firms have to cut down on supply, which necessitates a cut in the amount of labour employed. Therefore, during times of inflation, unemployment in the economy rises adding to the already serious problem facing India.

Another effect of a global price rise is a shift in the Terms of Trade (TOT) in favour of the exporting countries. And, since India is very dependent on imports, it suffers pretty heavily in terms of loss of real income to its trading partners.

Also, a price rise slows down the economic growth of the nation. It has been observed for India that a price rise of US\$ 10 takes off 1.1% points from India's growth rate.

Of course, appreciation of the rupee does help to lessen the impact of a price rise. Appreciation of the rupee by 12.3% this year really did help to partially offset the adverse effects of the sharp rise in the global oil prices.

But, in today's scenario, the fact that India is heavily dependent on the global economy is only half of the true picture. Going by the words of the petroleum and natural gas minister of India, Manishankar Aiyer, "The only way to the geopolitics of other is to have geopolitics of our own", India has indeed started making its presence felt on the global economy.

India's influence is showcased by the fact that its rate of economic growth has become one of the important factors on which the international oil price depends. This high growth rate is also posing a threat to the USA, the largest global oil consumer. This is because, higher growth rate implies greater need for secure energy resources and greater influence on price. Adding to this threat is India's growing proximity with China, Russia and Venezuela. Also, the fact that India has the fastest growing oil market is making the US and the other DCs nervous.

d) Effects of oil price on inflation

As discussed earlier, the most important fallout of rising oil price is inflation, which makes life difficult for the mostly poor masses of India and further complicates matters by inducing unemployment. Thus, it is imperative on the part of the Indian Govt. that proper steps be taken to fight the effects of inflation. Of course, the Govt. does cut duties on gasoline, kerosene and cooking gas as global oil price rises and so does inflation.

The Planning Commission has suggested some measures to fight inflation. They are :

1. Determine domestic oil prices according to export parity and not according to import parity, which is the currently used strategy in India. This measure will lower the price of oil.
2. Adopt proper fiscal and monetary policies.
3. Increase exports so that TOT move more in favour of India resulting in a rise of real income of the nation.
4. Rationalise tax burden on oil products over time.
5. Reduce duty on petroleum by 5% to equate it to the duty on crude oil.
6. Improve availabilities of domestic supplies of essential goods.
7. Add more to the international reserves.

MODEL - 4

Let us now look at a model that explains how an increase in oil prices fuel inflation and how it affects output.

Assumption

1. There is complete flexibility of prices.
2. The main emphasis of the model is fluctuation in real output and employment as the result of variety of real shocks such as technological progress, fiscal decision and energy prices such as prices of oil.
3. Classical dichotomy holds, that is, nominal variables cannot change real variables i.e. employment and output.
4. There is intertemporal substitution of labour for leisure.

The production function is given by :

$$Y_t = A_t \cdot L_t$$

Where, Y_t = real output

L_t = amount of labour purchased by the firms

A_t = MPL of labour at time 't'

Total time available to the worker \underline{L} is fixed and same in each period.

A part of \underline{L} is leisure and the other part is used for labour supply. (Here prices are flexible.)

Hence at each period, the amount of leisure consumed is :

$$l_t = \underline{L} - L_t$$

In each period, utility is obtained from leisure [l_t] and consumption C_t .

Therefore, the utility function is :

$$\begin{aligned} U &= U(C_t, l_t) \\ &= U(C_t, (\underline{L} - L_t)) \end{aligned}$$

MU of C_t and l_t are both positive

Let W_t be the real wage rate at time period t .

If it is earned and saved, then it will be $W_t (1 + r)$, where r = real rate of interest.

Thus, expected real rate of income in the next period = W_{t+1}

Here, the intertemporal substitution of labour = $(1+r) (W_t/W_{t+1})$

Here, we assume that, $r = 0$

Therefore, lifetime budget constraint is :

$$W_t \cdot L_t + W_{t+1} L_{t+1} + \dots = C_t + C_{t+1} + \dots$$

Objective of the workers is to choose C_t and l_t in each period that will maximize their lifetime utility.

Therefore,

maximising $\sum U (C_t, (\underline{L} - L_t))$

subject to the lifetime budget constraint

$$W_t \cdot L_t + W_{t+1} L_{t+1} + \dots = C_t + C_{t+1} + \dots$$

From here we get that, at optimum point, intertemporal MRS is equal to opportunity cost or shadow price of present leisure in terms of future leisure.

$$\text{i.e. } MU_{l_t} / MU_{l_{t+1}} = W_t / W_{t+1}$$

From here, l_t can be computed and L_t is determined from $\underline{L} - L_t$

An thus, Y_t can also be determined.

ANALYSIS

W_t is a great determining factor in economy in the short run. If the W_t fluctuates, output and employment will fluctuate. Now, one of the major factors which bring down W_t is the price of energy, or oil more specifically. Oil prices push the inflation rate which brings down W_t . Production costs of firms increase and hence they go for policies such as down sizing and cost cutting, which too pushes the W_t down. Thus, as W_t goes down, real output as well as employment decreases which leads to a temporary recession in the economy. Thus, growth in the economy goes down. Also, a temporary recession can bring down the MPL of labour force. Thus, the economy suffers in a dual way as this fall in MPL can have long term impacts on the economy.

e) Effects on final consumers

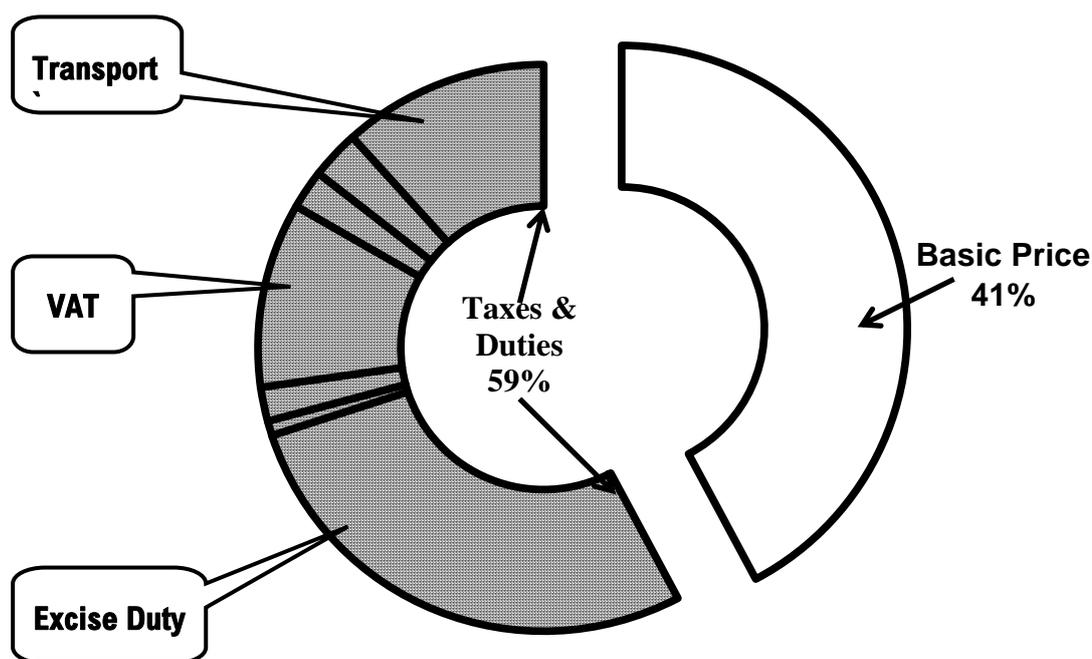
Rise in oil price causes increase in prices of fuel and energy generation and, thereby, makes all intermediate and final goods more expensive. This affects the common people diversely. One of those effects is increase in unemployment - reasons of which have already been discussed herein before. Furthermore, the increased cost of final goods are passed on to the final consumers by the entire supply chain. Amongst the consumers, middle class people are the worst sufferers, as prices of all sorts of domestic fuels rise too.

f) Case study on the Indian oil taxation structure

As already discussed, the price of petrol in India is the highest among all LDCs. The current price of petrol is Rs. 52.20 out of which more than 50% is eaten

up by various taxes. This is a pretty shocking phenomenon, especially for an LDC, as very few countries in the world impose this amount of taxes on petrol. And, all the countries that do impose more taxes are all rich developed countries, like, France, Germany and UK.

The various taxes imposed are excise duty, education tax, VAT, crude oil custom duty and petrol custom. Among these duties, the most severe ones are the excise duty and VAT. According to reports, excise duty has been hiked from 32% to 90%, although Govt. reports state that it has actually been reduced from 30% to 14%. But, surely, Rs. 14 cannot be only 14% of Rs. 22. This is also proof to exactly how ambiguous India's oil policies are. VAT, the other severe tax, is about 30% in most Indian states. And, this one has already landed into trouble with certain sections of the political fraternity suggesting that a reduction of atleast 7% is quite feasible.



Price of oil in India = Basic Price
 +
 Excise Duty
 +
 Education Tax
 +
 Dealer Commission
 +

Value Added Tax
+
Crude Oil Custom Duty
+
Petrol Custom
+
Transport Charges

Basic price of petrol, one of the most important component of oil sector, is amplified from around Rs. 21, in this way, to a final price between Rs. 50.50 to Rs. 52.00 in various parts of India.

A reduction of Excise Duty and VAT only to a reasonable limit, will reduce the oil price drastically. Present price of Rs. 52/- plus, may be reduced, if the Government of India shows the goodwill, to a range of Rs. 30/-.

M O D E L - 5

Assumption : Govt. of India reduces Excise Duty and Vat to such an extent that price of oil – specially, unsubsidised or nominally subsidised components of petroleum, viz. , petrol, by around 40%.

As per consumption and tax/subsidy data of early 2008,from Govt. of India documents:

When price of oil was 80\$ a barrel, Tax benefit to Govt. =	Rs. 90,000 crores
When price of oil was 130\$ a barrel, Govt. had to subsidise =	Rs. 25,000 crores
Therefore, loss to Govt. =	Rs. 1,15,000 crores

In other words,	
Increase in oil price from 80\$ to 130\$ =	Increase by 62.5%
And 62.5% increase in oil price causes loss to Govt. =	Rs. 1,15,000 crores

Now, if Govt. waives around 40% of tax/duty levied on oil, additional loss of Govt. =	Rs. 73,000 crores
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Therefore, total projected loss to Govt. =	Rs. 1,88,000 crores
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RECOMMENDATIONS :

The Indian Govt. can make this loss up through several other avenues, viz.:

1. **Curtailing Government expenditure, specially in oil sector PSUs. It is accepted fact that most of the PSUs have excess workers. Reduction of excess workers will give the Govt. substantial amount of surplus money.**

It is to be noted that, recently the centre has hiked salary of Govt. employees, burdening GoI with additional Rs. 20,000 crores per year.

Therefore, shrinkage of excess employees. Is expected to save the Govt. by similar amount.

2. **Similarly, outsourcing of PSU work and unburdening of GoI from retirement benefits, will reduce Govt. expenditure substantially, and, thereby, unburden national economy.**
3. **Creation of another slab in income tax, i.e., income over Rs. 10 lakhs per year and levying of higher tax rate, say of 40% on it, will attract good amount of money to the Govt. In view of recent surge in private sector enterprises in India and increase in private sector employees earning lakhs of rupees per month, this step will not only earn for GoI substantially, but will also decrease the pay-discrimination factor, reducing growing discontent amongst workers in various sectors in India.**

Furthermore, the centre recently tried to move a bill for raising level of income above Rs. 50,000 per month for defining the 'creamy layer'. Therefore, the final slab of Rs. 5 lakhs is too insufficient for higher income group.

4. **Abolition of unnecessary fringe benefits of GoI employees, viz., replacement of medical reimbursement by payment of health insurance premium, free pass for using government services etc., is expected to save the Govt. with large amount of money.**
5. **Imposition of windfall profit tax on private and public-private joint venture oil firms will create a large amount of revenue for the Govt.**
6. **Levy of exceptionally high rate of taxes and duties on certain goods / services, which are used by only the privileged class of people, and / or use of which should be curbed for social**

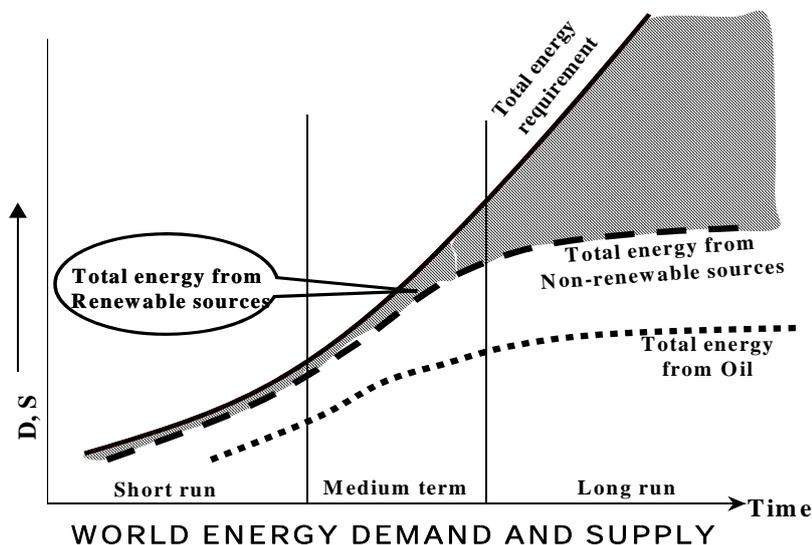
benevolence, should allow the Govt. to earn good amount of money. Some of such items are as follows:

- a) Luxury car,
- b) Car air-conditioning / luxury accessories,
- c) Wine and similar beverages,
- d) Cigarettes / bidis,
- e) Clubs, discothèques, etc.
- f) Luxury home gadgets, viz., washing machine, kitchen appliances, etc.
- g) Environmental pollutants,
- h) Income tax in agricultural sector, excluding marginal farmers,.....and many more.

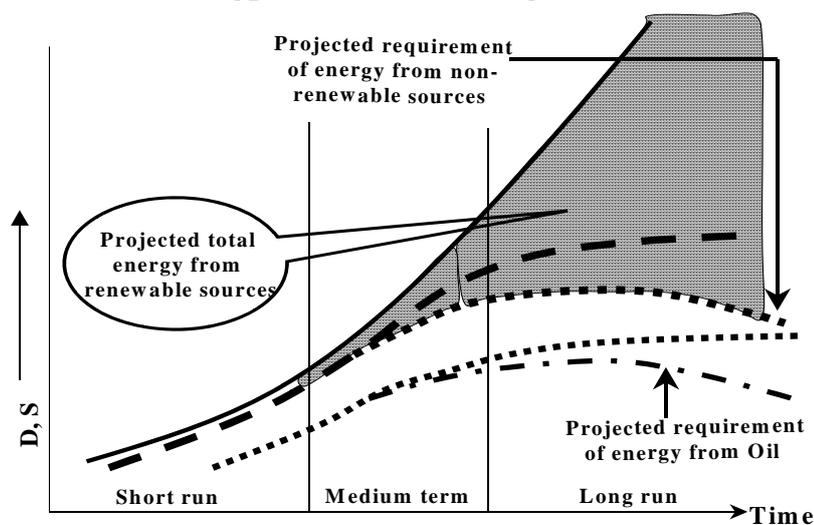
g) Looking at the Future :

Oil, being one of the most important sources of energy, plays a very important role in world economy and development. But, unfortunately, oil is available only in a small part of the world. Moreover, all types of fossil-based energy sources are rapidly depleting as their stores in our planet are limited.

The need of the hour is, therefore, is to reduce dependence on oil and, so to say, on all forms of non-renewable sources of energy.



Thus, science has to find out various sources of renewable energy. Nature has gifted us, since the dawn of



SUGGESTED STRATEGY OF ENERGY SUPPLY

civilisation, with endless sources of energy. It is the urgent duty of science to tap those energy sources for good of human race.

Of all the non-renewable energy sources, fossil-based energy sources, viz., oil and natural gases, coal, etc. are most vulnerable to rapid depletion of stores. Some other sources, viz., nuclear energy, requires very small amount of raw material for generation of large quantity of energy. Though, sources of uranium, thorium etc. are also limited, but it will take longer time for their depletion from the face of earth. Therefore, rapid conversion of dependence of major sectors of energy requirements from oil and other fossil-based sources of energy to nuclear power generation is urgently required, and, in fact, the developed countries and the rapidly developing countries of the world are following the path.

Use of renewable sources of energy is still largely at an amateurish level. Sun is a major source of energy which we need to utilise - both as solar heat generation as well as solar electricity generation. Wind is another enormous storehouse of energy. It should be utilised with increased vigour. Energy from flowing water, bio-gas, etc. must be utilised in much larger scale in near future.

Apart from preventing rapid depletion of non-renewable sources of energy, reduced dependence on renewable sources of energy, e.g., oil, will cause prices of those to fall. No monopolistic effect on the market will exist, leading to welfare maximisation. No fight-

fight situation will exist between the monopolist & the monopsonist.

The answer to all problems related to oil and politics webbed around oil industry will no longer exist once mankind opens the door of generation of large amount of energy from renewable sources, reducing, thereby, its dependence on oil and other non-renewable sources.

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