The demand for petroleum products is a derived demand. The maximum price that a consumer is prepared to pay for petroleum products depends on the value to him of using these products. For example, the maximum price that a motorist is prepared to pay for gasoline is the monetary expression of the pleasure or value to him of using the car.

Similarly the demand for crude oil is a derived demand. It depends on the demand for petroleum products. The maximum price for crude oil depends on the maximum demand for various refined oil products which are obtained from crude oil. The availability of substitutes to various petroleum products puts a limit to this price. Coal, natural gas, nuclear, and hydro-electric power are

1 The various petroleum products are:
   Gasoline which is known popularly as petrol in England and India.
   HSDO - High speed diesel oil.
   LDO - Light diesel oil.
   Kerosene, Fuel, Lubricants, wax, Bitumen, coke.
relatively close substitutes for fuel oil and therefore they put a limit to the price of fuel oil. But there are no substitutes for gasoline and therefore the highest price that a motorist is prepared to pay for gasoline tends to be closer to the value of gasoline to the car owner.

The minimum price of crude oil is the supply price. This is the cost of production including some minimum rate of profit for capital invested for meeting different levels of demand. Similarly the supply price of refined petroleum products consists of the sum of the costs of getting oil from the ground plus transporting it to the consuming centre and refining it. If the petroleum industry were producing only one product, the cost could have been assigned in this way but the production of joint products by the petroleum industry complicates the matter.

Pricing of Oil in India

The problem of oil pricing in India has two aspects. One is the pricing of crude oil and the other is the pricing of petroleum products. Both these aspects are interrelated. In fact, we can approach the problem of pricing of crude through the pricing of products. If one can determine the
prices of petroleum products independently of crude prices, then one can determine the price of crude oil by deduction. Given the prices of various petroleum products and the pattern of production one can arrive at the total revenue which a refinery gets by refining a barrel of crude. In the total revenue if cost of refining is deducted one gets the price of crude oil.

Similarly if the cost of crude oil is given independently, by adding refinery margin to the cost of crude one can arrive at petroleum products prices. But the nature of joint products complicates the problem here.

We shall be approaching the problem of oil pricing in India, through the pricing of crude. Since India is still dependent for its crude requirements on outside sources to the extent of more than 60 per cent of its consumption of crude, the cost of crude oil to India has to be taken as given. Prior to the unprecedented increase in the prices of crude oil in the international market in January 1974 the domestic cost of production of crude was higher than the cost of imported crude. After January 1974 the domestic cost of production of crude oil has become lower than the cost of imported crude oil.
Pricing of Crude Oil in the Past

The refinery agreements signed during 1951-53 with major international oil companies for the establishment of refineries in India, contained clauses regarding the supply of crude oil to these refineries. Since all the foreign owned refineries which were established in India were 'affiliates' of international oil companies operating in the Middle East, the parent companies looked upon these refineries essentially as outlets for their crude oil. Under the refinery agreements these refineries were allowed to import crude from their own sources at 'import-parity' prices. The import parity price was determined on the basis of 'posted price' at Abadan in the Middle East plus ocean freight and marine insurance with an allowance for ocean loss plus other handling charges and duty. It should be noted here that posted prices were not actual market prices. They were merely reference prices used to measure the tax and royalty payments from oil companies to host governments.

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2 Posted price for crude oil or products is the statement of the price at which a buyer or seller of oil is ready to do business with all comers prepared to buy oil in the quantities specified. The posting may be done by refiners as in the case of integrated oil companies in the US or by crude oil producers as in the Middle East.
But they directly affected the market price.

In the early 1960's there were certain changes in the world crude oil market which led to price cutting by international oil companies. At first price cutting was achieved by reducing the profit margins of the companies but later on, in order to reduce tax payments to host countries the major oil companies started bringing down posted prices. It should be noted here that royalties to host governments were calculated on the basis of posted prices. When the price reduction was resisted by the host countries the companies started giving discounts on posted prices to independent buyers. But they were charging undiscounted posted prices to their affiliates in India. This practice of offering discounts to independent buyers and charging posted prices to affiliates was so common that it gave rise to a saying that 'only fools and affiliates pay posted prices.' The Soviet Union's offer in 1960 of crude oil to India which was 25 cents cheaper per barrel than companies' QIF price, and the refusal by the foreign oil companies to refine Soviet crude in their refineries led to the appointment of a committee known as Damle Committee to investigate

into the problem of oil pricing. The Committee submitted its report in July 1961. The Committee found that crude oil prices were being discounted by many private companies in sales to other countries. The Committee recommended that the foreign oil companies should buy oil from the lowest price suppliers or force their own suppliers to cut crude oil prices to the lowest competitive price and eliminate intermediate purchasing companies which supply oil to Indian refineries.4

Subsequently two more committees were appointed. The second Committee known as "Working group on oil prices" submitted its report in August 1965. This Committee recommended discounts ranging from 30 cents to 45 cents per barrel depending on the quality of crude.5 The third Committee which is known as Oil Price Committee submitted its report in October 1969. It recommended discounts ranging from 37 cents to 51 cents per barrel.6 All the 3 committees have accepted the principle of 'import parity'.

as the basis of pricing of crude oil.

When the price of crude oil was fixed on the basis of 'import parity' the inland refineries were put at a disadvantage because of the higher cost of indigenous crude which they were refining. In order to compensate for this the Government gave subsidy to the refineries at Guwhati and Barauni to the extent of the difference between oil India's price and the landed cost of similar crude at Calcutta from the Middle East. Later on the Government of India, in order to remove this anomaly introduced a new pricing scheme from 1st February 1966. According to this new scheme indigenous crude prices were raised by relating them to the full i.e. undiscounted posted prices of analogous crude in the Middle East. But the foreign exchange allocation for crude import was continued on the basis of discounted posted prices plus basis. In order to keep the imported crude based refiner's per tonne crude cost on a level with that of the refineries based on indigenous crude, a protective duty was levied on the imported crude.

The chief objective of the Government of India in adhering to the principle of 'import parity' in the pricing of crude was to reduce the foreign exchange obligations on the import of crude. The practice of discounts on the posted prices in the sixties gave rise to dispute between oil companies and the Government of India. But in view of the far reaching changes that have taken place in the international oil industry, it is the producing countries and not the oil companies who determine the price now. The question of discounts has disappeared. The cost of imported crude oil to India is given by posted prices in the Middle East plus the cost of transporting it to India. As a result of the action taken by 'Organization of Petroleum Exporting Countries' (OPEC) the crude prices have increased as under (Table 6.1). The effect of this big increase in the posted price of crude oil is that India has to pay more for imported crude with consequent burden on foreign exchange.

While India has no option in the pricing of imported crude except stick to import parity, in the pricing of domestic crude it has a number of options. The price of indigenous crude is now fixed at Rs. 41.44 per barrel of onshore and Rs. 58.44 per barrel of offshore, Bombay High,
Table 6.1

Posted Price and Market Price of Aga Jari (Light) Crude in Dollar per Barrel

<table>
<thead>
<tr>
<th>Year</th>
<th>Posted price</th>
<th>Estimated arm length price</th>
<th>Discounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>2.04</td>
<td>1.79</td>
<td>0.25</td>
</tr>
<tr>
<td>1959</td>
<td>1.86</td>
<td>1.56</td>
<td>0.30</td>
</tr>
<tr>
<td>1960</td>
<td>1.78</td>
<td>1.43</td>
<td>0.35</td>
</tr>
<tr>
<td>1963</td>
<td>1.78</td>
<td>1.38</td>
<td>0.40</td>
</tr>
<tr>
<td>1969</td>
<td>1.79</td>
<td>1.29</td>
<td>0.50</td>
</tr>
<tr>
<td>1971 (After Tehran Feb, Agreement)</td>
<td>2.17</td>
<td>1.70</td>
<td>0.47</td>
</tr>
<tr>
<td>1971 (After Tripoli June Agreement)</td>
<td>2.27</td>
<td>1.79</td>
<td>0.48</td>
</tr>
<tr>
<td>1972 (After Geneva Agreement)</td>
<td>2.47</td>
<td>1.89</td>
<td>0.58</td>
</tr>
<tr>
<td>1973 (After Oct. 16)</td>
<td>5.12</td>
<td>5.12</td>
<td>-</td>
</tr>
<tr>
<td>1974 (Jan)</td>
<td>11.63</td>
<td>11.65</td>
<td>-</td>
</tr>
<tr>
<td>1977 (Jan)</td>
<td>12.70</td>
<td>12.70</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>12.08</td>
<td>12.08 (For Saudi and Emirate Oil)</td>
<td>-</td>
</tr>
</tbody>
</table>


Figures for 1977 are from News Week Nov. 22, 1976.
even though the price of imported crude is now more than 12 US dollars per barrel. This policy of pricing domestic crude at a lower level than that of imported crude is not justifiable. We have here three alternatives in the pricing of indigenous crude.

(1) Pricing on the basis of marginal cost of production.
(2) Pricing on the basis of cost plus.
(3) Pricing on the basis of import parity.

We shall examine each one of these 3 alternatives:

(1) Marginal Cost Pricing

Even though Prof. M.A. Adelman has advocated marginal cost pricing of crude oil, it can be shown that under the present conditions of the petroleum industry in India, it is not possible to apply this principle.

(i) India is dependent for a major portion of its requirements of crude on foreign source. Nearly 2/3rd

of its requirements are imported from foreign countries. Therefore, when India is not in a position to meet all the demand for crude oil indigenously there is no point in making marginal cost of production at home as the basis of price. If we have to produce all the crude indigenously what would be the marginal cost of production of a tonne of crude oil? It is not possible in the immediate future to produce that much oil at short notice. Therefore, till the country attains self-sufficiency in oil or at least till it produces a major part of its requirements indigenously the marginal cost cannot be the basis of pricing.

(ii) Moreover, exploration for petroleum is an increasing cost activity. In a given country the agency which is engaged in exploration for petroleum will have to arrange the development of petroleum resources on the basis of their profitability. An area which is rich in petroleum will be taken up for development first and poorer areas next. Therefore, the long run cost of exploration and development goes on increasing. This is true when the entire country is surveyed and geological and geophysical material is collected. In the absence of such a survey, if an agency takes up an area for
exploration and if it strikes oil, the marginal cost is less, but if it does not get oil the marginal cost increases. Therefore, when the exploration and development is undertaken on a piece meal basis the marginal cost of production of oil cannot be the basis of a long-term price policy.

(iii) Additional investments in exploration for petroleum are in lumps. Therefore, the marginal cost curve over a period of time assumes the shape of a set of steps rather than a smooth curve. In such a situation it becomes difficult to calculate the marginal cost of production of a tonne of crude oil.

(iv) Crude oil is produced by three different agencies in India: ONGC, a public sector undertaking, Assam Oil Company a private sector undertaking and Oil India Limited a joint sector undertaking. The scales of operation of these agencies are different. The cost of production and the marginal cost of production are different in these different agencies. If we have to determine the price of crude on the basis of marginal cost the question is which cost should we take as the standard one?
(v) The marginal cost pricing of crude will lead to correct allocation of resources within the energy sector provided that all other forms of energy like coal, electricity are also priced on the basis of their marginal costs. So long as other energy resources are not priced on the basis of their marginal costs, the marginal cost pricing of crude does not provide investment criterion.

(vi) Moreover in an increasing cost industry like petroleum exploration and development the marginal cost pricing will lead to huge profits at the cost of the consumer. In an economy which is already suffering from high energy cost this type of solution may not be desirable.

(2) Cost Plus

Before October, 1973 the cost of production of crude oil in India was higher than the cost of imported crude oil. But after October, 1973 when the prices of crude oil were increased in the international market the cost of production of crude oil in India has become lower compared to the cost of imported crude. In such a situation if the indigenous crude is priced on the basis of cost of production, it is valued at less than its true cost to the economy. It's real cost to the economy is the price
at which crude can be had from another country. If the crude is priced at less than its imported cost we will be encouraging the wasteful use of a scarce resource. Therefore, the average cost pricing cannot be accepted as a basis of pricing especially in case of scarce resource like petroleum.

(3) The only alternative left is the import parity basis of pricing of crude. When India is dependent to the extent of more than 60% of its requirements of crude the import parity basis of pricing reflects the real cost of crude oil to the economy. Once India attains self-sufficiency and establishes sufficient reserves of crude oil can the basis of pricing of crude be changed to domestic cost of production. Therefore the price of the domestic crude should be raised to the level of the cost of imported crude.

The delivered cost of imported crude would consist of the price paid for the crude at the exporting port and the cost of the ocean transport to bring it to India and the cost of handling at the port. Since there are significant economies available in using large size vessels for transport of crude, it should be brought in large tankers. The price paid at the exporting port plus the cost of
transport together should be the price of the crude to Indian refineries. The crude that is produced in India should also be priced on par with imported crude by levying a surcharge on domestic crude.

**Pricing of Petroleum Products**

Before independence India's requirements of petroleum products were met by imports, except for small production at Digboi refinery. Since the marketing companies in India were the subsidiaries of major international oil companies, they followed a "single basing point system" as was the practice in those days both for products as well as for crude. The products were so priced as if they were exported from the U.S. Gulf even though the products were actually exported from the Middle East. Therefore, an importer in India had to pay freight from the U.S. Gulf for the products which he imported from the Middle East. There was an element of "Phantom Freight" - the difference between the calculated and the actual freight, in this system of pricing. When this practice was questioned by the Auditor General of U.K. at the time of the IInd World War because the bunker supplies to the East of Suez were obtained from the Persian Gulf area, the Persian Gulf became a second basing point. But the level of prices in the Persian Gulf were
fixed on par with U.S. Gulf prices. This practice of Persian Gulf as the basing point was continued even after independence of India.

Valued Stock Account Formula

In 1949 the Burmah-Shell entered into an agreement with Director General for Supplies and Disposal (DGSD) to supply petroleum products to the Government according to 'Valued Stock Account' formula, which was fixed on the basis of 'import parity' principle with Ras Tanura (Persian Gulf) as the basis point. Burmah-Shell charged the same price to other consumers also. The other oil companies, even though they had no such formal agreement with the Government continued to charge the same price as Burmah-Shell. The agreement came into effect from 1st April, 1950. According to this formula the prices for all bulk refined petroleum products were determined by adding all the following elements.9

(i) F.O.B. of petroleum products at Ras Tanura.
(ii) Ocean freight from Ras Tanura to Indian Port.
(iii) Marine Insurance.

(iv) Ocean loss.
(v) Remuneration at 10 per cent on C.I.F.
(vi) Import Duty.
(vii) Interest on Delivered at 2½ per cent on duties.
(viii) Charges from C.I.F. to ex-installations.

This formula of pricing of petroleum products was advantageous to the companies as it guaranteed all C.I.F. and post C.I.F. charges. Since the Burmah-Shell was the price leader all costs were fixed on the basis of cost of marketing by Burmah-Shell. Since all marketing costs were automatically covered there was no incentive on the part of Burmah-Shell to reduce costs. The valued Stock Account was terminated by the Government in 1958 and the chief cost Accounts Officer of the Government was deputed by the Government to conduct necessary examination and make proposals regarding new price formula. He submitted his report to the Government on 28th May 1959. According to this report the marketing charges instead of being 10 per cent profit on C.I.F., should be 10 per cent profit on capital employed by Burmah-Shell in 1957.10 The oil companies did not agree to

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10 Capital, 3rd September, 1959.
price reductions suggested in the report. The oil companies submitted revised proposal jointly and an ad hoc agreement was reached in October 1959. This agreement covered the period from 1st April, 1959 to 31st March, 1961.\(^\text{11}\)

Meanwhile the Government appointed another committee known as the 'Oil Price Enquiry Committee' which submitted its report in July, 1961. The Committee accepted the principle of import parity as the basis for product prices but recommended discounts ranging from 3 per cent on Furnace oil, 5 per cent on motor spirit, 10 per cent on kerosene on the basis of existing F.O.B. prices of products.\(^\text{12}\)

Subsequently another Committee on oil prices known as Talukdar Committee was appointed on 12th May 1964 which submitted its report in August 1965. This Committee felt that discounts higher than the ones recommended by the oil price enquiry Committee are now available for imports on regular basis. The Committee recommended discounts off f.o.b. Abadan ranging from 3 per cent on 'Aviation Gasoline' to


\(^{12}\) Ibid, p.163.
15 per cent on 'Aviation Turbine Fuel'. Similarly the oil price Committee headed by Mr. Shantilal Shah which submitted its report in 1969 recommended on the basis of discounts available on crude, a 4 per cent uniform discount on f.o.b. prices of all products. All the 3 Committees appointed by the Government accepted the principle of import parity as the basis of pricing of oil products in India, but they only differed in respect of the rate of discount applicable to f.o.b. prices of these products. Depending upon the rate of discount available in the international market, at various times, these Committees recommended discounts applicable to the prices in India.

The import parity formula of pricing is to the advantage of the international oil companies having their refineries in India. Under import parity formula an Indian refinery processing imported crude oil will secure a higher refinery margin than refineries in Persian Gulf, because the ocean freight for products is higher than that for crude. There are economies in the transportation of crude rather than finished products. The foreign owned Indian refineries are

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Guiding to their prices the ocean freight for products whereas they actually import crude. They are pocketing the difference between the freight of crude and products over and above what is obtained as refinery margin in the Persian Gulf. This difference is going to increase in future because of the developments in giant tankers which are capable of handling only crude oil. Import parity therefore cannot be accepted as a basis of pricing.

Before we advocate an alternative pricing policy for oil products, we may mention two important criteria for any price policy for oil products. They are:

(i) It should cover aggregate costs.
(ii) It should conform to broader national economic policies, while also approximating as far as possible to the demand and supply conditions in the Indian market.

The marginal cost pricing cannot be applied to the pricing of oil products because of the joint production of many products in a refinery. Under such situation deriving marginal cost for each product is impossible.

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What is the alternative? Once the price of crude oil is given, the real problem in product pricing is one of determining refinery margin. The relative price structure for different petroleum products not only should ensure a minimum margin of profit to the refineries but also at the same time give rise to pattern of production consistent with the pattern of consumption. Obviously a price structure which suits one refinery will not ensure minimum profits to another refinery because of the difference in the pattern of production in the two refineries.

Therefore, the refiner's margin should be worked out for each refinery taking into consideration its capital costs. The Oil Prices Committee headed by Dr. K.S. Krishnaswamy has accepted as reasonable return of 10 per cent on net fixed assets and 15 per cent on working capital for refineries. Operating costs per tonne of crude differ from refinery to refinery depending upon the product pattern of the refinery and the method of refining adopted. Taking into consideration the cost of crude as given by import parity, cost of capital and refinery margin, the ex-refinery prices for products should be

determined for each refinery in such a manner that the petroleum products which are consumed by poorer section of the society like kerosene are priced lower compared to other products like gasoline which are consumed by better off section of the society.

But, as products are produced jointly in a refinery, there is the problem of allocation of production costs as between different products. Here various combinations of prices are possible. However, the availability of substitutes and the use to which a particular petroleum product is put can be guiding factors here. The prices could be fixed in such a way that the refineries get an ex-refinery price for different products which taken as a whole, cover the cost of inputs and allow a reasonable profit on the investments made in refineries.

When product prices are thus fixed for each refinery there will be no uniformity in product prices among different refineries. In order to ensure uniform prices to consumers there should be a central pooling mechanism which will buy the products from refineries. The cost plus pricing principle would ensure a minimum margin for each refinery and also uniform prices for products. In
fact the system of retention prices for each product and for each refinery has been introduced with effect from 16th December, 1977. In calculating retention prices a return of 15 per cent on the total capital employed is allowed.

However, the price at the retail level is fixed by imposing taxes over the refinery price and adding the transport cost and trade margins. The government has more scope to manoeuvre prices at retail level. Depending upon whether the government wants to discourage or encourage the use of a particular product, it can impose taxes or give subsidy. In this way the government can discourage the use of petroleum products for which substitutes are available. Since the government can vary the taxes from time to time, the retail prices will also change whenever there is change in taxes imposed. This policy can be used to avoid shortages and surplus in any particular petroleum product. Therefore the import parity formula of fixing prices of petroleum products should be given up as India produces almost all the petroleum products that it consumes now. A price formula based on production and consumption

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pattern of petroleum products elsewhere cannot be a sound basis of pricing in India. Any pricing principle of petroleum products in India should take the pattern of consumption in India. A cost plus principle of pricing for products therefore will best subserve the national interest.