Energy Economics and Policy
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Week - 07
Energy Market: International Oil Market
Lecture - 01
Oil Market: Pre-OPEC Era I

Welcome back to the 7th week of the course Energy Economics and Policy. As we started our discussion on the energy market last week, this week too we are going to continue our discussion on the same. But unlike the structure that we followed in the previous week, this week we are going to follow a different structure of presentation. In the last week we discussed more theoretically about the perfectly competitive and monopoly market structure and tried to see whether the features of the energy market allow it to fit in the competitive structure or in the monopolistic structure. There we discussed several features of certain energy markets for example, the electricity market and natural gas market etc. This week we will not start with any theoretical background but we will start with a little bit of history here.

This week we will be discussing the oil market. Oil market has a very defining characteristic, it has a very rich history. As we proceed you will see that the structure of the oil market kept on changing from time to time. What makes the oil market very interesting is that, from the very beginning, that is mid-19th century, 1859 when commercially the business of crude oil and oil refinery started, from that time onward it took one decade to build up the industry.

After that we see, the oil market was an international market in nature, right from the very beginning and therefore it observed various international players, production houses, how the interplay went on, what kind of influences they had on price, what kind of market share did they have. All of these things create a very rich history of the formation of the oil market at the international level and that is what we are going to discuss this week.

So, in this video we are going to cover descriptive material, later on we will move towards the analytical parts of the energy market or more specifically of the oil market. Now, if you look at the slide you will see that I have written it as ‘Oil market: Pre-OPEC Era’. OPEC is the Organisation of Petroleum Exporting Countries, it was formed in the 1960s and this was the rupture point in the history of the oil market.

We have therefore divided the lecture essentially into two broad parts, one is the pre-OPEC era and the other is the era after formation of OPEC. In this video even if we talk about the pre-OPEC era that is quite long; so, we have divided this era also in two parts. In this video, we are going to talk about the first era before OPEC.

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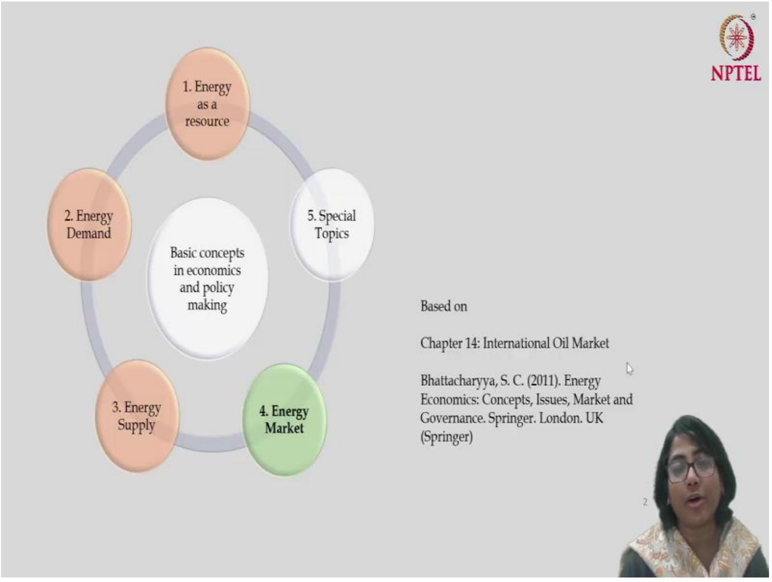

This lecture is basically based on one of the chapters that I have taken from the book Energy Economics Concepts Issues Markets and Governance by Professor Subhesh Bhattacharya. This is the book I have been referring to in the previous lectures as well. This is chapter 14, it's called International Oil Market, if you are interested you can visit and check the chapter. So, most of the material of this discussion has been taken from this chapter.

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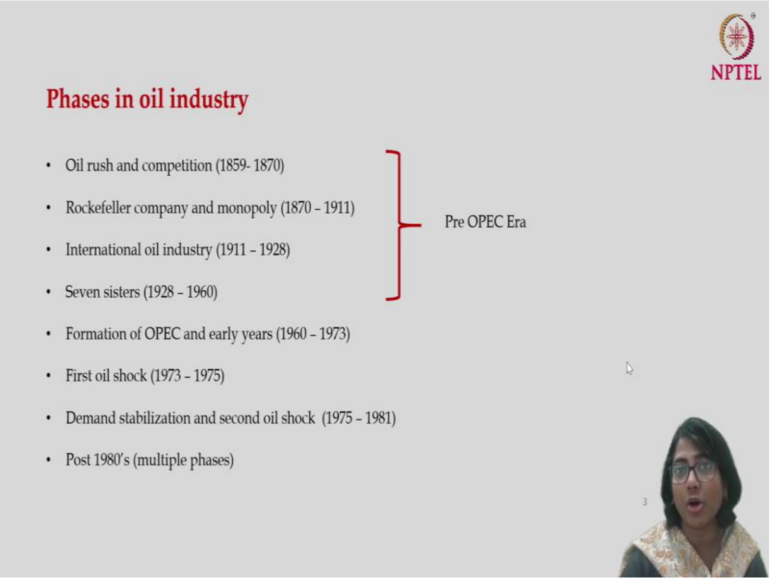

As said earlier, the oil market has a very rich history, it has seen lots of ups and downs, very different types of participation of various international companies and different ways of behaviour, different types of margin and acquisition, etc.

We try to divide the phases in oil industries in different parts. These are not always the most accurate ones but they are some of the defining periods in the history of the oil market. We will start with 1859 when the commercial operation of oil started and for 10 years or so there was the period in the US called the period of oil rush.

We will explore each of these periods separately but I will just tell you the names at the very beginning. During 1870, the Rockefeller company came into the picture and they set-up an oil company, called the Standard Oil Company. This was again a very defining moment in the history of the oil industry.

Then we come to 1911-1928, where the monopoly of the Rockefeller company and Standard Oil was towards the decay. Here, we see some sort of a competition arising in the oil market as more number of oil companies started participating in the market structure. This went on till 1928. 1928 is the era which is called the rise of seven sisters.

When we talk about seven sisters, these are the new oil companies that were formed out of Rockefeller company or out of the Standard Oil Company. This was the period where 7 oil companies dominated the world oil market till 1960.

If we look at these four phases, these are the defining phases before the OPEC was established. Then in 1960 the OPEC was formed; we will discuss the formation of OPEC and the initial years with OPEC. Then we will talk about 1973, we all know that was the year when the world experienced the first oil shock following the Yom Kippur War and certain political tension in the geopolitical environment.

After that we will talk about post 1975 which experienced another oil price shock, however, that period was also considered to be a period of demand stabilization. Afterwards, we discuss multiple phases in post 1980s, those are little different. So, these are the different phases which are very important if you want to understand the emergence and the structure of the international oil market.

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So, we start with the pre-OPEC era and as I said in this lecture I am going to discuss the first phase of pre-OPEC era.

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Let us start with a little bit of history. There is a lot of dispute and controversy about who was the first one to commercially start digging the oil out of the wells. There are many opinions about this, one of the most strongest positions is that Colonel Drake and William Smith operated a well which was situated near Pennsylvania in the US. In that well they found oil in 1859 and that was considered to be the first modern well in the history of crude oil.

One claim is that they were the first one to use a drilling process, before that it was all a kind of digging process that was going on. So, if we try to go back a little, I mean before 1959, oil was found out in the coal mines and then it was realised that it can be used as a fuel; and then people slowly got interested in it. However, whatever be the beginning of the oil industry in the world, we can see that after 1859, that is after the Drake and Smith's oil came up, there was a lot of rush to find out whether the land that you are owning at the subsurface level has oil or not. So people really got interested in it.

Now, it was this period that was called the oil rush and it was a private initiative which was going on. It was facilitated by the fact that as per US law, the ownership of underground resources was conferred to the owner of the land. It meant that if I have a private land holding, I am also the owner of the underground resources in it. Thus at private initiative a lot of drilling activities were on.

Everybody tried to find out whether there is oil beneath the land that they own. It was not really for commercial purposes as the commercial model was yet to be developed but people could understand that this is a valuable resource which they can have. The second thing they could also understand was that it was a competition among neighbours.

What happened after 1859? From 1859 to 1870, for this one decade there were a lot of activities, private small activities went on towards the drilling and discovery of oil in the land of the US, especially surrounding the Pennsylvania region. Now, one needs to understand that although there was a rush to find out oil, the technology was premature at this stage.

So, the technology was not quite able to tell you whether the stock is there or not. It was not very efficient to dig out the oil as well. Although a lot of activities went on, the efficiency level was not very high.Therefore as I have mentioned in the third point that given the low rate of recovery of oil with less technological advancement it led to high rate of drilling with low rate of recovery. A lot of investment and activity was there but the rate of recovery was low, why was that so? So, because of the technology also not enough studies were undertaken to understand whether the oil reserve is there or not. This initiative was entirely ad hoc in nature, so we see that there was an oil rush, so there was a supply of oil in the market if you think it in that way.

Now, the moment we think about the oil market its not only supply, but also the demand that comes into question. During the middle of the 19th century the demand for oil was very limited. You didn’t have demand for oil from the automobile sector or from the industries, etc as this was not a known fuel. The only use that people could think about of oil was to use it as a lighting fuel. Although the production of oil was going on in an inefficient manner, whatever supply was there in the market that was too much to match the demand, so there was an excess supply in the market. Therefore, during this decade of oil rush we see that the supply of oil is increasing through private ad hoc initiative. However, the demand is too low and therefore, the price of oil gradually declined over this period of time. So, during the oil rush the market experienced high supply, low demand and therefore, a low price of oil. So, this is the beginning of the commercial operation of oil, or you can say the genesis of the international oil market.I won’t not say international at this point, but this is probably the genesis of the oil market.

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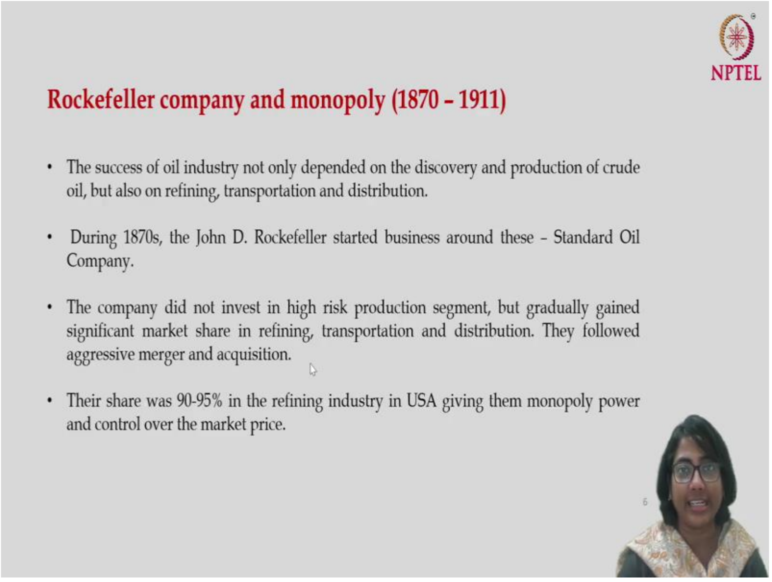

Let us see what happened in 1870. Whatever we have talked about so far is basically focused on the production of crude oil. You take the resource out, however, when you get the crude oil, the crude oil is not really the usable form of fuel, so one important thing is , you have to make it usable. Second thing is that after digging out the oil out of some well, you have to transport it to other places. People started realising that it's not only the production of crude oil, but there are other different businesses, and production operations which should be there, along with the production of crude oil.

Three very important such peripheral industries are refining, transportation and distribution. Now, realising this fact, there are other industries than production of crude oil in the 1870s, John D Rockefeller, the US investor and entrepreneur initiated a business in the line of refining, transportation and distribution. This company was called the Standard Oil Company.

He was very fast sighted and could realise the fact that production of crude oil involves a lot of investment as well as a lot of risk at the same time. Thus in a thoughtful manner, he avoided the risk of production of crude oil, but he invested in refining, transportation and distribution.

And this was the first company who started this kind of a business around refining, transportation and distribution. Gradually they started gaining their monopoly power over the market, and small firms They started at a very big scale and we know now from the our previous week's lecture on monopoly that if there is a very big monopoly firm then it has some automatic advantages and if it is a natural monopoly then it's actually not very profitable for other firms to operate. Now, Standard Oil Company was so big that whatever small companies emerged around that point of time, in order to do business in refining at the end of the day they found themselves merged with the Standard Oil Company.

The market share of Standard Oil Company became very high. If you see the last point, their share was 90% to 95 % in the refining industry in the US giving them monopoly power and the control over the market price. This is the typical feature of the monopoly. If you look at the 19th century oil market, this is basically the oil market scenario in the US.

US was the main producer and the distributor of the oil. However, after 1870 we see, certain other players started coming into the market. But what we wanted to say is that Standard Oil starting from 1870, enjoyed a huge monopoly power, market share and control over price for a couple of decades.

Initially for the first 10 years it was a competitive market structure there was no barrier towards entry and exit. Suddenly post 1870 for a few decades there was some monopoly from the Standard Oil Company. This Standard Oil Company is very interesting because today all the big oil companies that you see, their genesis is in Standard Oil Company for example, ExxonMobil, BP, not BP is not part of this, but ExxonMobil which were earlier Exxon and Mobil, two different companies then they merged. They all emerged from Standard Oil Company, so it was bifurcated and then merged and so on. Standard Oil Company has a very long and dominant history in the context of energy, especially the oil market internationally. This Standard Oil Company was in operation till 1911, that is from 1870 to 1911. Although they could not enjoy the entire monopoly power for the total duration but they were in operation.

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What triggered the fall of the monopoly power of Standard Oil Company? This is another interesting bit of history. So far we have seen all the discussions are around the USA, as all the discoveries and the production of crude oil were mainly in the US. Now, 1870 is a very deciding time in the history of the oil market. Why? Because, in 1870 people started discovering oil in parts of the world other than the USA; in Russia, in 1872 the oil was discovered in the Baku region. The Noble Brothers acquired the well and started transportation of oil from Russia to other parts of the war world especially the western countries, so the export of oil took place.

Another big discovery of oil in 1870 was in the Dutch East Indies which is now Indonesia. There also the operation was started by the Royal Dutch Company and Shell. Later on the Royal Dutch Company and Shell both merged and they were called the Royal Dutch Shell. That was the early 20th century and when they merged, they got a very high market power in the domain of international oil market .They expanded their operation from Indonesia to other parts for example, Romania, Venezuela, Egypt and US as well, so they started selling the oil to the US as well. These are the two very big discoveries of crude oil at that period of time. Along with that certain other areas of the world also started discovering oil for example, Mexico came into the picture after a while.

Not only the other parts of the world but also in the US, the operation was now not concentrated near Pennsylvania but in other parts of US oil was discovered and the operation was started.

The two of such big companies are Texas Oil Company and the Gulf Oil Company. Gulf Oil Company operates in the Gulf of Mexico region.

Most of these companies started operations in the global market. This is very important and a very interesting feature with respect to oil. All these companies are big companies and the moment they entered into the business, they entered into the global market. It's not that they started in a small domestic company and then they became a player in the global export market. From its genesis itself oil was such a product that it required international transaction, international import and export and therefore, all these companies became the player of the international market from the very beginning.

Again, this backdrop is very interesting, Why is it so? Because now oil is being discovered in various parts of the world, some other companies are coming into the picture and they are gaining the market share. Now we, let us see, what happens to the Standard Oil Company? Obviously, when some other companies are emerging, the share of Standard Oil Company has to go down. So, the importance, the market share, the market power of Standard Oil Company which had some monopoly power, it started coming down.

This weakened the structure of the Standard Oil Company a bit. Later on, in the beginning of 20^{th} century, around 1908 or so they also engaged in some legal dispute and finally in 1911, the Standard Oil Company was divided into five smaller companies. The moment a big company divided into five smaller companies, all of these five small companies lost their market power which they used to enjoy as a part of a bigger company.

You can observe that there are three phases, the first phase: the first decade 1859 to 1870 there was no monopoly; 1870 there was emergence of Standard Oil Company, Rockefeller company and they enjoyed market power and monopoly power for a few decades.However, the situation was so that gradually other companies came into force and they started operating and the Standard Oil Company also broke down and now in the market there were multiple suppliers. So, the monopoly structure breaks down. I am not going to say that this led to a perfectly competitive market structure but if you think the market in terms of a scale; that is perfectly competitive market being in one extreme of the scale and monopoly being to the other extreme of the scale. Then definitely during this period during the early 20^{th} century the market structure of international oil moved away from monopoly towards little bit of competition. These are the reasons what triggered the fall of the monopoly power.

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Now, we will see what happened after the Standard Oil Company was broken down into small five companies, what was going on, what was the scenario of oil? So far, we haven't talked about the demand. All we said was that in 1859 when the international oil market emerged, when in Pennsylvania the oil well started operating, at that point of time the demand for oil was very restricted, it was only probably for lighting purposes. However, after a few decades, half a century passed from that and people discovered that there are other very important uses of oil and the biggest one of that was the automobile industry.

So, first thing is there was a demand from the automobile sector because now the whole structure of the automobile sector has changed. It has become fuel driven and there was a lot of demand for oil from the automobile sector in the early 20th century.

The second very important thing in 1914 the First World War started, it went on till 1918 and during this period countries who were engaged in the war demanded a lot of oil for their military activities, for transportation, to run the arms and all other services. Thus there was a huge increase in demand for oil.

Now, one may think that World War lasted for 4 years and after that the demand might have reduced but that was not the case. This initial part of this initial decade of the 20th century, gave a boost to the demand for oil and which never declined, it went up and up.

This is the era where for the first time the oil market experienced a high increase in the demand for oil. Thirdly, high demand also came for the industries, such as transport sector industries and the First World War. All these three things they all together contributed to the increase in demand for oil in the international market.

Now, once the demand has been increased, the oil companies realised that they have a scope to increase the supply. Oil at that point of time as you know, the discovery and the recovery of oil was going on at a very fast pace. So, if the oil companies wanted, they could increase the supply to a great extent at that point of time.

So, triggered by the fact that there is an increased demand, they became very enthusiastic, if I don't say over enthusiastic. Everybody started producing and supplying too much oil in the market. They could understand that there is an increase in demand but probably they were not very clear about the magnitude of the increase in demand.

As a result, the supply that they created in the market was much higher than the demand and led to a glut of supply of oil during the period of 1928 or so. The moment again you will see that the supply exceeds the demand, the price of oil will fall and this led to a crash of price in the international market in 1928.

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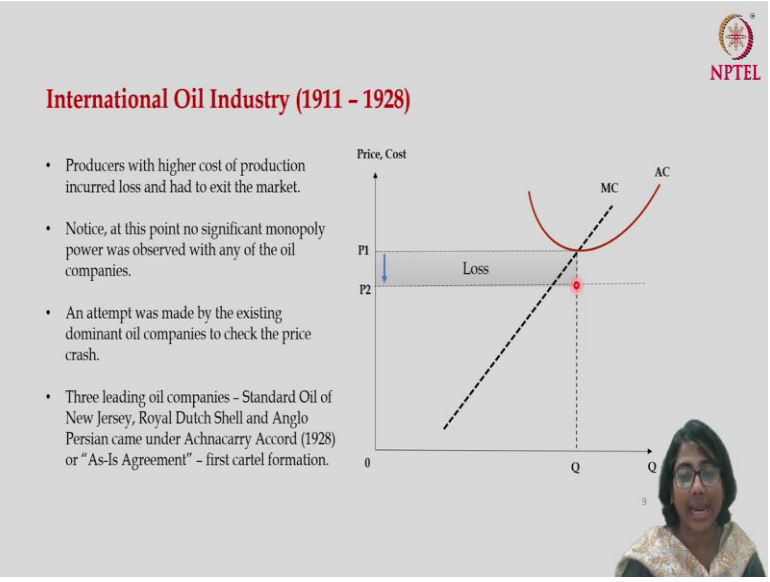

Now, what happens if there is a price crash in the market in 1928? Again, if I take you back to the theory of this competitive market structure. Because, now the period that we are talking about, there is no longer the monopoly of the Standard Oil Company. Now, the producers who are operating in the high, in the oil market, what happens to them if there is a price fall?

So, this is the known diagram from perfectly competitive market structure. Let us suppose initially before there was the increase in supply and there was a crash in price, maybe the equilibrium price was P1 and there was some oil industry who were operating at their break even point. If they were supplying their product at the price P1 and Q was the quantity supplied in the market.

So, they were operating on their marginal cost curve and they were also operating at the minimum point of their average cost curve that is the breakeven point. Now, the moment there is excess supply in the market and the price falls, let us assume that the price falls at P2 what happens to this well-run firm? This firm realises that it no longer operates at its breakeven point because it has to come to a lower point and if it has to operate at the price P2 it experiences some kind of loss in the long run. So, it's unable to recover the total cost of production in the short run, it's the price that is falling short of the average cost. So, it's falling behind the breakeven point,

If this kind of loss continues for a longer period of time then what happens? This firm has to exit the market. So, this is what was experienced in 1928 once the price came down, many of the firms had to exit the market. Now, again notice that at this point we are analysing whatever had happened based on a competitive market structure because we don't see strong monopoly structure at this point of time in the international oil market.

This was a tricky situation because the suppliers never wanted the price to crash. They understood that they have to do something in order to check this falling price and what did they do? The three big leading oil companies at that point of time, of course one is Standard Oil but this is not the old Standard Oil that we were talking about. You remember that in 1911 the Standard Oil was broken into five smaller companies and one of them was Standard Oil of New Jersey. So, Standard Oil of New Jersey, this later on became Exxon and now they have become ExxonMobil.

This Standard Oil of New Jersey, this is the first one operating in the US, the second company the Royal Dutch Shell who were operating in Indonesia and then the Anglo Persian Oil Company they were operating in Persia, that is currently Iran. So, these are the three main companies who were operating in the oil market at that point of time. They sat together, discussed and decided that something needs to be done in order to check this fall in price in the global oil market. So, what did they do? They came into an agreement which is well known as the “As-Is Agreement”. We will just explain why it is called an “As-Is Agreement” but this is a very important agreement in the history of oil. As we discuss the points of this “As-Is Agreement” we will come to understand that probably this is the first sign of a cartel formation by the oil companies in the international oil market. So, what is cartel formation? Some dominant players in the market or some followers in the market as well can, be a part of the cartel and then they come to some understanding about the market share which is good for all of them. If all of them stick to the agreement then it’s good for all of them and the incentive is created in such a manner that if one person deviates from the cartel then, it may not be good for that person and the cartel can break.

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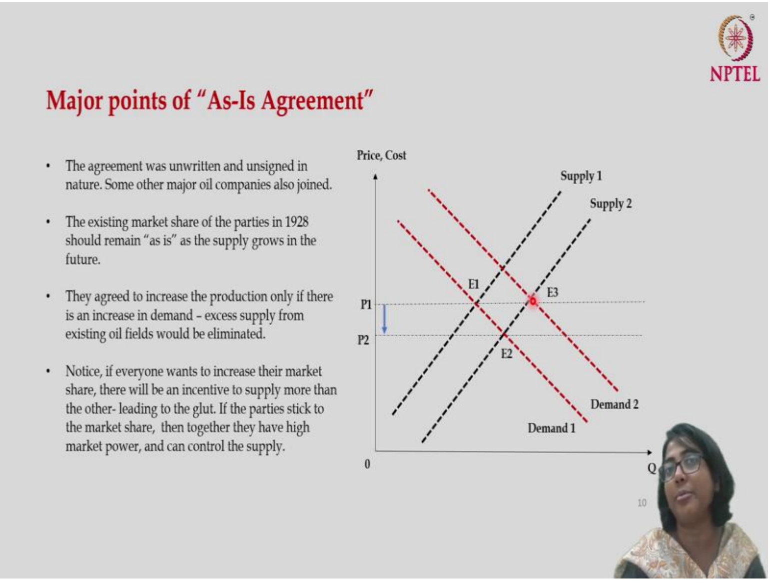

Let us just have a look at what are the major points, what they did as a part of this “As-Is Agreement”? Before I go to the points of the “As-Is Agreement” one very interesting thing and this is often the characteristic of a cartel. Although we are calling this an agreement there was no written document available, there was no signature that was done, so it’s not a written and signed agreement.

It was a verbal understanding that was negotiated within a group of major players in the oil market in 1928. What did they say? They decided that in order to check the falling price, what these companies should do. Not only these three companies but some other companies also joined for example, the Texas Oil company joined. We will see the other many, I mean, some 6-7 other companies also joined and they decided that they are going to stick to the market share, their market share which was existing in 1928.

Where does the name 'As-Is' come from? The market share is going to remain as it was in 1928. So, if the market share of for example, Standard Oil Company of New Jersey is x percent in 1928 then in future also it's going to keep it x percent. Now, why is keeping the market share constant so important? Because you see when the market realises that there is an expansion of demand then each of the oil companies will try to produce and supply more in order to increase their market share.

If you increase your market share then you gain some market power. This initiative to increase the market share is actually leading to oversupply in the market. Now, if you fix your market share and then when their demand increases, all the companies they sit together and they say, okay that increase is demand is for example, 5%, then all of us, whoever is in this cartel all of us, we are going to increase the supply in the market in order to suit that increase in demand by five percent. However, our increasing supply will be in such a manner that the market share remains constant. So, nobody is going to cheat the other and exceed the market share as compared to what is existing in 1928. This was the unwritten agreement and understanding which these companies came to.

They also agreed to the fact that they will increase the supply when they get a clear indication that there is an increase in demand, so the market will be demand driven not supply driven. When there is an increase in demand only then the supply will increase. Now, why this particular clause that it should be demand driven has a very strong implication to check the fall in price?

Let us look at this diagram, let us assume this is the initial demand condition, this can be thought of as the moderate demand condition and this is the initial supply of oil in the market by the existing companies. So, E1 is the equilibrium where supply is equal to demand and the price that is charged in the market is P1. This is the equilibrium price that is decided.

Now, if it is the case that irrespective of increase in demand or the case that the supply increases when there is no increase in demand then what happens? Then the demand curve doesn't change; however, since I am increasing the supply, so the supply curve shifts rightward as a result, what happens? The equilibrium shifts from E1 to E2.

The moment the equilibrium shifts from E1 to E2 the price falls from P1 to P2. This is what was happening in the oil market before they came into this “As-Is Agreement”, okay so this P if the price falls to P2. Now, what they are saying is that the supply will increase only when the demand increases, that is the supply curve will shift from supply curve 1 to supply curve 2 but only if you have a clear indication that your demand has also shifted from demand curve 1 to demand curve 2.

Now, if increase in supply was in response to an increase in demand then your equilibrium point doesn’t shift from E1 to E2 it will rather shift from E1 to E3 and therefore, the price will remain unchanged. So, if you, your supply actually comes in response to the demand then probably there will be a check on the price, so that it does not go down in the international market.

This was the idea behind the agreement that they had. This is what we were saying that if you form this kind of cartel probably, I will not go into the details of the theory of cartel. Probably it gives you a situation that if all the parties stick to the cartel and stick to the agreement it is good for all of them.

However, if one person breaks out of it then it’s bad for everybody, so that is the idea of cartel in many of the times. This is a turning point in the history of the oil market, the international oil market, this “As-Is Agreement” in 1928.

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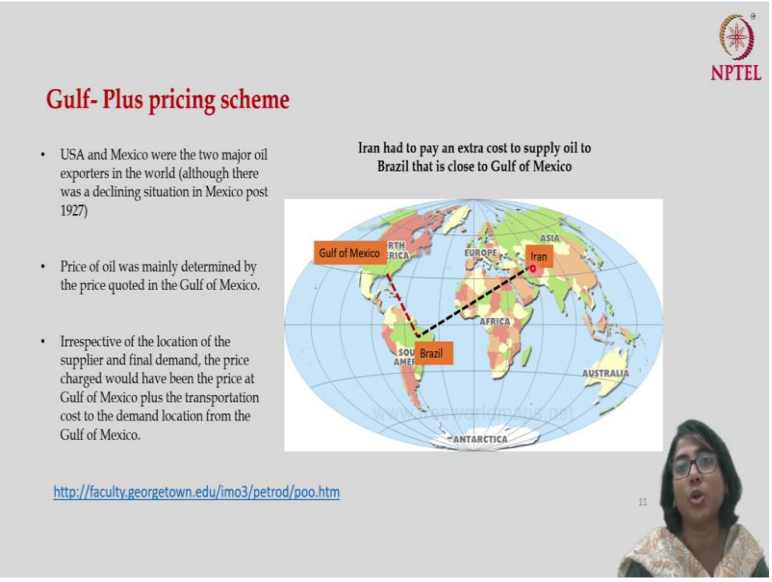

Now one very crucial component or crucial offshoot of this “As-Is Agreement” was the Gulf-Plus pricing scheme for the international oil market.We will discuss briefly what is this Gulf-Plus pricing scheme. This stayed for a long period of time, the essence of this Gulf-Plus pricing scheme and then the market moved out of this particular scheme. This was one of the very important pricing mechanisms in the oil market during 1927-28.

So, if you look at who were the major players during 1927-28, although you will see that from 1870s onwards, in several parts of the world oil was being discovered and you had several suppliers of oil in the market. But if you look at the international market even in the early 20th century the two most important players were the US and Mexico. They dominated the oil market in the world. Although there were other players and since they had a dominance over the market, the price of oil was majorly dependent on the price that was quoted in the Gulf of Mexico. They were controlling the price as well and there was a mechanism of price that they followed. It might seem a little illogical or a little weird, the mechanism they followed, but it had a logic. It says, if I read this third point out, irrespective of the location of the supplier, and the final demand, the price charged, the oil price charged would have been the price at Gulf of Mexico plus the transportation cost to the demand location from the Gulf of Mexico.

So, no matter who the supplier is whether you are supplying the oil from Indonesia or from Europe or from Iran, it doesn’t matter. The price that you can charge is some base price which is quoted at Gulf of Mexico, plus the transportation cost from Gulf of Mexico to the location from where the demand is coming.

It’s not the transportation cost from the supply location to the demand location, it is the transportation cost from the Gulf of Mexico to the demand location and that was called the Gulf Plus pricing scheme. So, the base for the entire pricing scheme was the Gulf of Mexico and this could happen because of the dominance of the US and Mexico in the world oil market at that point of time. This will become a little clearer as we go into this explanation .If you look at this map of the world, here is the Gulf of Mexico and here somewhere we have Iran. Let us assume that we need to supply oil to Brazil. Now, if I have to supply oil to Brazil given the Gulf Plus pricing system, what do we have? If I am supplying it from the Gulf of Mexico then the price charged will be equal to the price quoted at Gulf of Mexico plus the transportation cost from Gulf of Mexico to Brazil.

This is the price that will be charged if the oil is transported from the Gulf of Mexico to Brazil. There is no problem in this because price includes your transport cost, cost of production, etc. However, if Iran wants to supply oil to Brazil, then what happens? It gets the quoted prices at Gulf of Mexico plus the transportation cost that is required to cover only this distance between Gulf of Mexico and Brazil. Now, see the distance between Brazil and Iran is much higher as compared to the distance between the Gulf of Mexico and Brazil.

Essentially we can say that the transport cost of the Gulf of Mexico to Brazil will be much lower than the transport cost of Iran to Brazil. If the price only recovers the transport cost from the Gulf of Mexico to Brazil then Iran is actually losing in terms of non-recovery of some of its transport cost. Thus, Iran had to pay an extra cost to supply oil to Brazil which is close to the Gulf of Mexico.

So, if any country wants to supply oil to some location which is close to the Gulf of Mexico, but not so close to the supply location then they are in a disadvantageous position. If you do that what happens? If you do that, you ensure that in the neighbourhood of Gulf of Mexico, in the neighbourhood of US and Mexico the dominance or the market power of US and Mexico as an exporter will remain unchanged.

If Iran can’t recover the transport cost, when they supply to Brazil they would rather not supply to Brazil, they would allow the Gulf of Mexico to supply to Brazil. However, this is one part of the story, the other part of the story is that through this price mechanism, countries in the middle east or countries which are far off from the Gulf of Mexico they can gain something as well.

How and what is the gain? This is the loss that they are incurring out of the Gulf Plus pricing scheme. Now, what can they gain, if you see a location which is closer to Iran right for example, in India. If Iran wants to supply oil in India what is the price that they are going to get? Iran will get the price which will be the quoted price at the Gulf of Mexico plus the transportation cost of oil from the Gulf of Mexico to India.

What is happening in this case? In this case, in order to transport oil from Iran to India which is much less expensive as compared to transportation of oil from Gulf of Mexico to India. However, when the price of oil is calculated for Iran it takes into consideration this long distance and a high transport cost.

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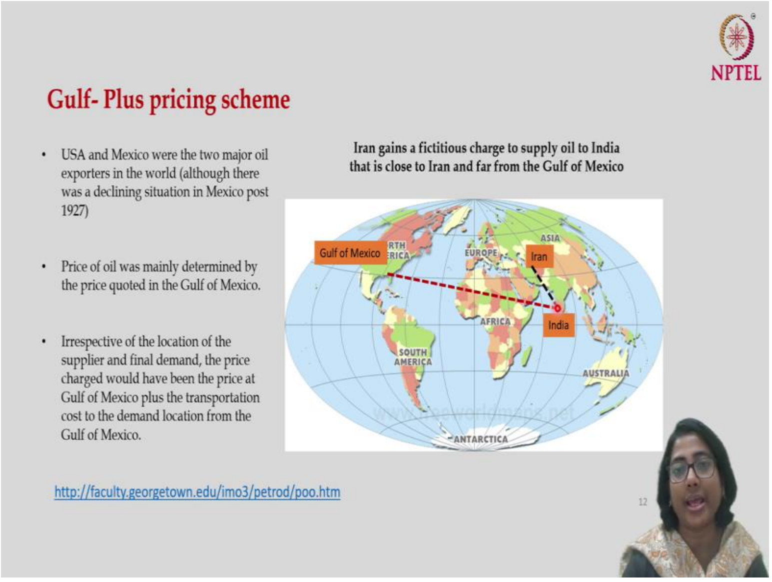

If Iran is supplying oil to a country like India which is close to Iran, but far off from the Gulf of Mexico then Iran gets a fictitious charge to supply oil to this kind of location. Ideally the situation is that if a Middle East Country where you are newly getting the oil, wants to supply oil to a location which is close to Middle East but far from Gulf of Mexico then they are earning some fictitious charges, so they are some fictitious benefits.

However, if they want to supply oil to a part of the world which is not close to Iran but close to the Gulf of Mexico then they lose in terms of trade or transportation charge. This is called the parity. This was idealized as a parity, so if one part nullifies the other, that is, if you supply oil in different parts of the world, for some part you lose in terms of freight and in some part you gain this fictitious charge. Overall things get nullified and the parity is being set up. That was the idea behind it. But you can see that this kind of price mechanism is possible only when the US and Mexico have market dominance.

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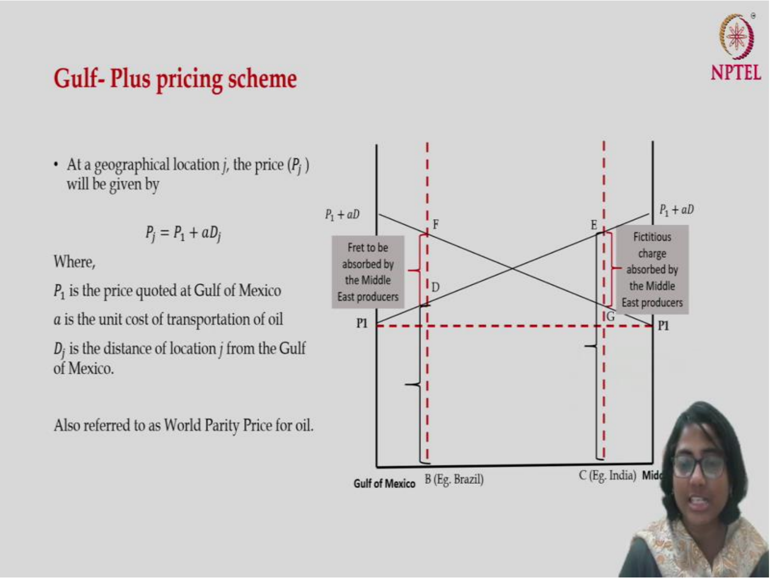

Let us look at this diagram which will make things a little more clear about the Gulf-Plus pricing mechanism. The maths looks like this, it's very simple, suppose there is a geographical location j, where the price of oil being charged to this country is called Pj. So, this Pj will have two components, one is P1 plus a Dj, okay. What is P1? P1 is the price quoted at Gulf of Mexico. This is the price at Gulf of Mexico, the base price. Let us say, this is the P1, the base price. What is 'a'? 'a' is the unit cost of transportation of oil. What is the unit? This is the unit cost of transportation oil. Now, if the location where oil is to be transported, is situated at Dj kilometres away from Gulf of Mexico then the total transportation cost is : a x Dj

At any geographical location, irrespective of the location of the supplier the price of oil would be equal to: P1 + (a x Dj). You can see as the distance from the Gulf of Mexico to the location of demand increases the price also increases irrespective of the location of the supply.

This is the price, Pj = P1 + (a x Dj). This is also referred to as the World Parity Price for oil and why parity, because, as I've explained, for some cases you are losing in terms of freight, for some cases you are gaining the fictitious charge and therefore there is a parity which is reserved.

This diagram actually makes it very clear. I have taken two locations. This is the Gulf of Mexico and this is the Middle East. If you start from here and go to your right, this shows you the distance from the Gulf of Mexico. If you start from the Middle East and move towards your left that shows the distance from Middle East to the location where you want to supply and this P1 as I said, this is the quoted price at Gulf of Mexico.

As you move away from the Gulf of Mexico, if you want to supply oil to some area which is further away from the Gulf of Mexico, this is how the price increases. The distance between this dashed line and this solid black line captures the transportation cost. Now suppose the Gulf of Mexico wants to supply oil to some location B for example, Brazil which is close to Gulf of Mexico, then the price that is being charged to Brazil will be BD.

Starting from here up to this line, so up to this broken line this is P1 and this is actually 'a' multiplied by D. The slope of this line is actually 'a'. If Gulf of Mexico wants to supply oil to point C which is far off, then this is the price that will be charged from India, EC amount of price. But whether it is far off or whether it is close, the price is covering the actual transport cost. There is no problem, there is no fictitious charge or there is no payment of freight from their own pocket for the Gulf of Mexico.

However, the trick comes here. If you are supplying it from the Middle-East you remember, that this is the Middle-East and as we are moving left, we are going further away from the Middle-East. So, the distance between the Middle-East country and the demand location increases.

If you supply from the Middle East then the cost of supply increases along this line. As you go further away from the Middle-East country your cost of transportation increases along this line. Here also the absolute slope of this line is 'a' and the difference between distance between this dash line, broken line and the solid line is 'a' multiplied by Dj, so this distance is the transportation cost.

This line captures the actual cost that is incurred by the Middle-East countries in order to supply oil to different locations in the world. Now, see what happens, suppose this Middle-East country wants to supply oil to Brazil. What is the price that they are getting? They are getting the same price as the Gulf of Mexico is getting. The price that Middle-East is going to get is again BD. However, the cost that they are incurring is more than BD, the cost that they are incurring is actually FB. So, this difference FD, this is something which they are unable to recover through the price mechanism and this FD part is actually the freight that this Middle East country has to bear from its own pocket.

This is the freight to be observed by the Middle East producers, this is the loss for the Middle East producers. However, the same Middle East producer when they are supplying to India, then what is happening? You see the price that they are charging, that the price that they are getting from India is EC same as whatever the Gulf of Mexico is getting.

But what is the cost of supply of the oil? The transportation cost is much lower in this case, in this case CG would represent the cost of supply of the Middle East country to a country like India. However, the price that they are getting is higher than the cost of supply and this gap represents this difference between the cost of supply and the price. This EG part is actually a fictitious charge which is being absorbed by the Middle East countries.

This fictitious charge is a gain for the Middle East country and this freight that they are losing is a loss for the Middle East countries. This shows that the Middle East countries or any, this is an example, for any other country for that matter would actually be reluctant to supply oil which is farther away from their supply location but close to the Gulf of Mexico.

This is the mechanism through which the US and Mexico secured their neighbourhood zone where they are exporting oil. This is where we are going to stop in this lecture and in the next lecture we will continue with this and we will talk about what happened in the post 1928 era.

Thank you.