Petroleum Economics and Management
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Module - 04
Price of Oil
Lecture - 17
Movement of oil price

Hi everyone, I am Dr. Anwesha Aditya in your instructor for the course of Petroleum Economics and Management. We are in module 4 of our course where we are discussing a very important topic in the syllabus that is Price of Oil. So, in the second lecture of module 4 that is our lecture 17 overall in our course we are discussing the Movement of oil price.

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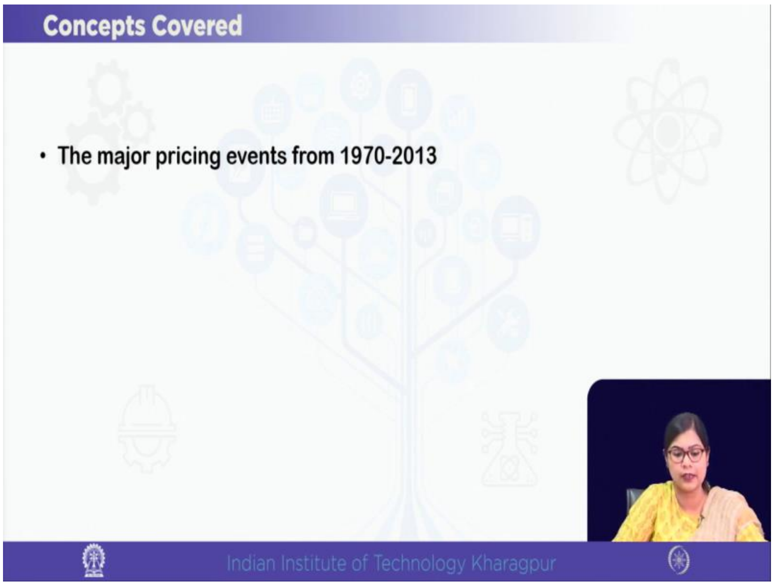

So, in the last lecture which was the introductory lecture in module 4, we already discussed what is the importance of paying special attention to the oil price movement. And we saw that oil price movement is just incomparable not only with respect to other inelastic agriculture products, but also with respect to other type of resources like metals and minerals.

So, that is why we need to spend time to understand the nature of oil price movement. So, what is the reason of such oil price movement we need to know and how the oil price has fluctuated so much, why? Because overall we see a rising trend, but there were sudden abrupt changes also, sudden spike or sudden dip. So, we need to understand that we need to analyse it in very detail, because change in oil price leads to huge consequences, spiral in effect in the economy.

Because we know that oil is mainly used for transportation; so, if oil price increases cost of transportation will increase. There will be overall inflationary pressure in the economy, because with increased cost of transportation, cost of production in agriculture manufacturing, even in the services sector will increase. Not only that oil is also used for energy consumption; so, oil price increase will have important impact on energy needs.

So, like India being a major importer of energy and the largest part of India's energy demand is made by fossil fuel; so, increased oil price has huge impact on India's foreign exchange reserve. So, we need to understand and learn from the past that how the global events economic as well as non-economic events have impact on oil price.

So, with this motivation in mind we have designed the 4th module in today’s lecture. We are going to discuss the major pricing events from 1970 to 2013, later we will be updating. Because, if you remember we have already mentioned about the impact of the COVID-19 pandemic and the Russia-Ukraine War, but that will be in another lecture.

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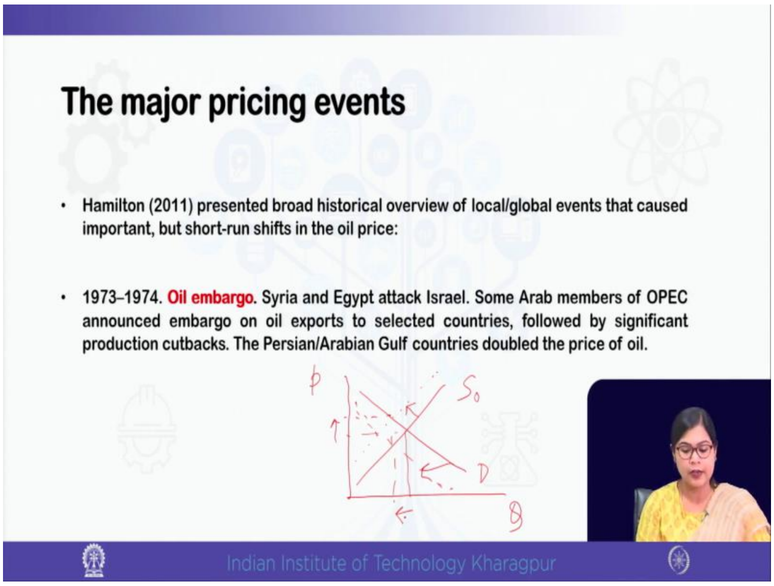

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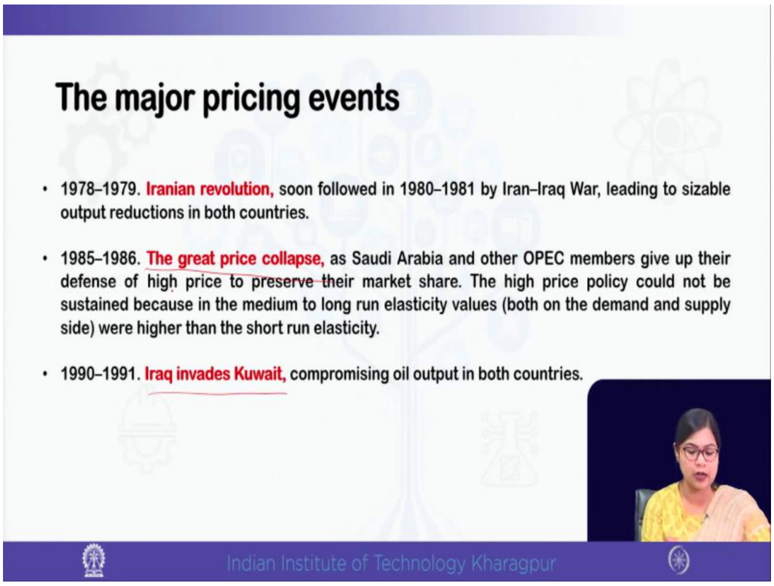

So, in today's class I am focusing till 2013, because lot has happened in the global oil market in the post 2013 era.

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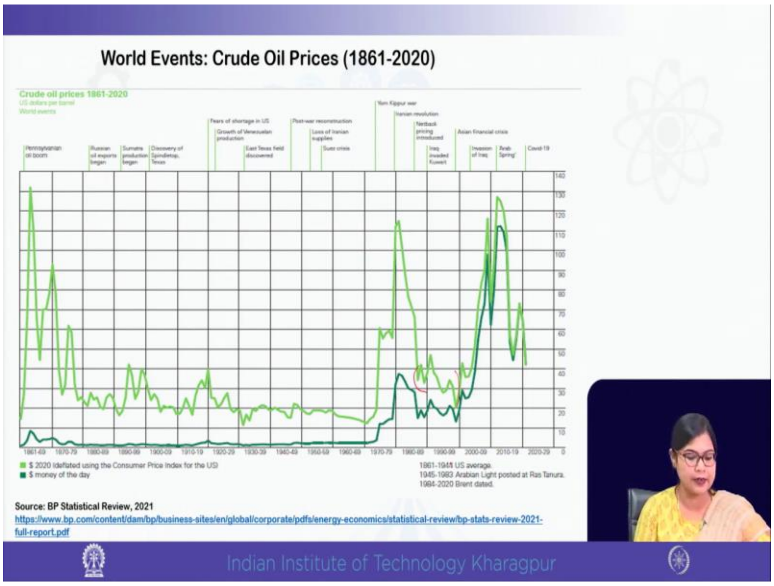

So, why from 1970 onward? Because, we just now discussed in the last class that from the beginning of the oil industry to 1970’s almost oil price was in a more or less in a particular range there was not too much fluctuation. So, there was a steady oil price nature we can see from this figure also; so, this figure is taken from the BP statistical review 2021. So, the source is also given with the hyperlink, anyone interested to have a more detail insight on oil price movement request those to look into the original report.

So, here what we have plotted is you can see the green line that corresponds to the 2020 dollar value which is deflated using the consumer price index of US. And the deep dark green color line correspond to the dollar value on the current year. So, we have plotted the data from 1860, you see and if you remember in module 1, we have discussed the historical perspective of oil use.

And we saw that oil industry more or less started developing in the modern form 1860 onward. But we found there has been ancient era also where oil has been in use in the many ancient civilization like in the Chinese or the Brazilian civilization. But mainly the oil industry the current shape started being developed in Pennsylvania in US in 1860 onward and the major driving force behind the growth and development of the US economy has been oil.

And in the post World War II era the economies were restructuring; so, demand for energy and demand for transportation fuel increased and that led to huge increase in demand for oil. So, from 1970 onward more or less we can see upward rising price of oil as you can see from this figure; so, that is why we are focusing mainly in the post 1970 parts. So, more or less you can say last 50 years or 5 decades to will be discussing about the latest price movement.

So, what happened from 1970 onwards? So, we are majorly following the famous paper of Hamilton 2011 in this regard to discuss the oil price movement and relating the oil price movement with the major economic and non-economic event which had short run impact on oil price.

So, these oil price changes were very quick abrupt changes; so, we are discussing all such events. So, what was the first event that was the 1973-74 Oil embargo? So, what happened was that Syria and Egypt they attacked Israel and some Arab members of the OPEC. You remember we will be also discussing in the next module in detail about OPEC; so, I am not going into discussing the OPEC structure right now.

So, what happened in 1973 and ‘74, some OPEC members the Arabian country members of OPEC they announced an embargo on oil export to some selected countries and this was followed by significant production cutback also. Now, we already discussed that OPEC is the leader in the world oil market; OPEC supplies a large a significant part of world total oil supply. Though it is not the monopoly, because given the huge demand for oil, OPEC cannot fulfil the entire world demand.

So, we do have non-OPEC suppliers like US or Russia, but OPEC is a leader. So, when OPEC restricted its production and also the Middle East countries the Arab countries which are the member of OPEC they restricted their export, because they are the major supplier of oil. So, if they restrict their export and overall, their production; so, obviously, what will happen? Total supply of oil will fall right.

Now, you remember why we studied in detail the price movement how price is formed and how the equilibrium is affected when there is a change in the demand side or supply side. So, if you remember we have already discussed in the basic of microeconomics part that if there is a change in either demand and supply side, what will happen.

So, if we plot the demand and supply curve and if we see what happens if there is a change in the supply side, because these two the embargo on oil export and production cut back, what will happen? The total supply of oil in the world market will fall. So, with a fall in supply we know that we have a inward shift or leftward shift in the supply curve. So, that increases the price and lowers the quantity transacted from the equilibrium initial equilibrium right; so, price increases and quantity transacted falls.

So, this is the main reason of the oil spike in rise in oil price in 1973-74. So, now, you understand why we need to spend some time on understanding the very basic of the economics issues like the how there is a change disruption in the equilibrium if there is any kind of shock either in the demand side or in the supply side. Then so, you can relate the with the figure also.

Now, what was the next event? The next event was the revolution in Iran in 1978-79 and that was followed by the Iran-Iraq War of 1980 and 81. So, you see there were back to back two, events one was the Iranian revolution and then the Iran-Iraq work. And this revolution and the war led to production reduction from the two countries both, Iran and Iraq and they are being major supplier of oil.

Again the oil supply declined in the global market; so, similar figure you can draw ok. I just drawn one figure. now you can draw other figure for each of the event and you can see graphically what happens if there is a fall in demand or there is a fall in supply. So, here we see in both the first two events, there was fall in the supply the entire supply schedule shifted to the left or inward shift resulting into higher price; so, these are the two main reasons.

Now, see from the 1979 onward OPEC started defending the high price of oil. So, OPEC policy was to increase the price of oil, to maintain the oil price at this higher level. Because, the idea is that if price is high then how do you operate? So, you have to limit the quantity. So, they wanted to earn a higher revenue they wanted to have more profit. so that is why the OPEC countries restricted their output and maintained a high price.

But what happened as in the last lecture also I discussed we mentioned the 1985-86 as the great price collapse era. Why? Because we will see that OPEC and especially Saudi Arabia had to abandon the high price policy. So, in 1986 what happened was that Saudi Arabia and other OPEC members they gave up their defence of high price because they are losing their market share.

The high price that OPEC maintained from 1979 onward, by reducing their production that could not be sustained because what is the reason for that? The reason was mainly you see the way we have drawn this. So, initially what happens if you remember in the basic of microeconomics part, we discussed in detail about the elasticity, the nature of elasticity values over time.

And if you remember we discussed that for most of the product the elasticity of demand and elasticity of supply values are greater in the longer run than in the short run. Why? Because in the demand side what happens? If there is a sudden increase in price of let us say petrol and if suppose you have petrol driven automobile, can we change our car overnight? No. So, what we can do? We can gradually reduce our consumption.

So, following a sudden price increase abrupt unexpected price increase a petrol, we would not be able to change our car overnight, but off obviously, our demand will fall because we may be cutting back on our say long drives, unnecessary trips we may be using more a public transport. So, what happens? Even if price increases quantity demanded may fall, but by less than proportionately.

So, this is with respect to demand whose elasticity is less in the short run. But what happens in the longer run? In the longer run the person the consumers can change their consumption habit gradually. So, in the longer run or even in the medium run after few periods if the increased price trend continues the households or the consumers can change their car they can switch to electronic vehicles or they can even sell off their car they may be reducing they may be using more of public transport right.

So, in the longer run or in the medium run we can change our consumption habits; so, elasticity of demand increases in the long run. Now, in the supply side you see, the supply side in the very short run if any price increases, we do not have good substitutes of oil in the market.

But what happens in the long run? Now, in the longer run the countries can come up with alternatives of energy like, if you remember we already discussed that from mid 1980 onward oil was gradually replaced for energy production by other type of renewable or sustainable sources of energy.

From mid 1980 onward the new power plants that were built were mainly based on alternative sources of energy like; hydroelectric power plants, tidal plants or the energy based on solar power. So, this is more true for the developed countries and because the developed countries found that for keeping their standard of leaving high for transportation, for energy needs we need to depend on energy.

So, they started looking for alternate sources of energy. So, oil was gradually being replaced by alternate sources of energy in the supply side. So, that means, what? That means, in the medium to longer run, in the supply side there are more alternatives or substitutes available to oil as compared to in the short run.

Therefore, elasticity of supply in the longer run is; obviously, greater than the elasticity of supply in the short run. That means what? That means, in 1979 when due to the Iranian revolution and the Iran Iraq War oil price increased the elasticity values were very low in the short run the elasticity values were low both in the demand side and in the supply side.

So, OPEC and mainly Saudi Arabia defended this high price and continued to restrict their output to enjoy the high price and high oil rent. But this policy could not be sustained for long because after 5, 6 years what happened in the medium run? We just discussed that there were both more substitutes in the supply side in the demand side also the consumption pattern gradually started changing.

So, basically this elasticity values of both demand and supply increased in the mid-80s compared to the early 1980s or the late 1970s. So, this is the main reason that OPEC and mainly Saudi Arabia had to abandon their or give up their high price policy ok. So, this period is referred to as 1986 this is referred to as the great price collapse and more or less you see the price was maintained at a lower band.

So, this is also referred to as the low price period as I mentioned in the previous lecture where we discussed we mentioned these as the low price period you see. More or less the oil price was in a lower band till 1998 and 1999. Then what happened? In 1990 and 1991 we had the Gulf War which also had some impact on Indian economy as well which we will be discussing towards the end of our syllabus.

So, in 1990 and 1991 Iraq invaded Kuwait reducing oil output in both countries and in other classes previous classes we also discussed about Gulf War. We will be coming back to this Gulf War again towards the end of our syllabus.

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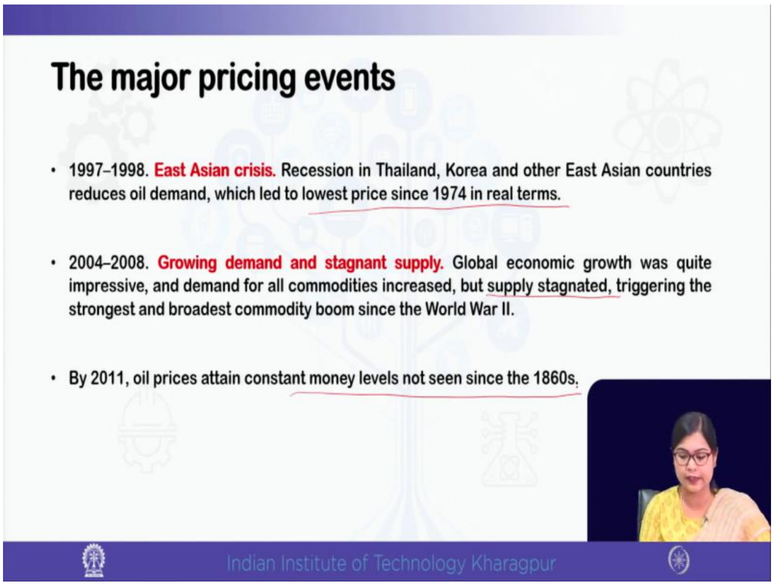

So, in this way the oil price continued at a more or less moderate level and in 1997 and 1998, if you see there was again a deep in oil pricing and that reason was mainly the demand side factor. Till now, we discussed only about the supply side, but now in the fall in oil price was due to demand side factor, there was a recession in some Asian countries like Thailand, Korea and other East Asian countries.

So, this is known as the East Asian currency crisis and this led to reduction in oil demand. Because, what happens, recession is when the output growth falls for some period; so, if the recession is lasting longer that is called depression. Now, in 1997 and 1998 some Asian countries experienced a recession which reduced their demand for oil, because as in if income falls there will be a fall in demand for oil.

So, you can interpret this in graphical form; so, this will be a fall in demand. So, in the demand curve will shift. So, if demand curve shifts in we know that price will fall, quantity transacted will also fall and price will fall; so, we can see that. So, due to the Asian currency crisis we can see that the demand curve actually it is like a inward shift in the demand curve ok.

So, due to the Asian currency crisis there was a demand side fall in oil which led to the fall in oil price and which has been the lowest price since 1974 in real term. Now, after 2000 the trend reversed, we can see from this figure very clearly that oil price started increasing especially after 2004 onwards.

Because, overall, 2005 is referred to as the commodity boom period the world economy was doing very good; so, there was a growing demand. So, global economic growth was quite impressive and the demand for all commodities increased. And obviously, demand for all commodities increased what happens?

You have a greater need of production in a larger scale, demand for transportation increases, demand for energy need increases. So, oil demand increased and that led to increase in price of oil because supply was stagnated. So, again there is a demand increase in 2004-5 period with a stagnation in the supply side and that led to a strongest and broadest commodity boom since the 2nd World War leading to high price of oil.

So, we can see that how the events the global events both economics. So, these last two events you can see these are the economic events and the previous ones these are the geopolitical events the war how these events affect the oil price so much. And of course, we have the very important role of Saudi Arabia and OPEC.

Within OPEC Saudi Arabia is considered as the swing producer; so, it can change the price it can alter the price given its high market share and the control over other OPEC members. So, we can see that oil price again increased during 2005 to up to 2008 and if the rate trend continues by 2011 oil prices attend constant money level which was not seen since the 1860's you can see over here.

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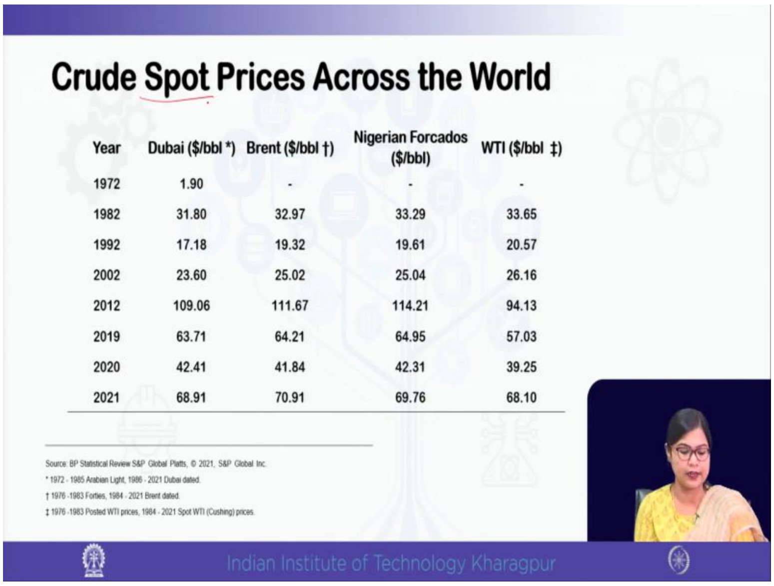

So, it was very high in 2011, and we have also plotted some data for your easy understanding; so, we plot the crude spot price. So, what is a spot price? That is the current market price of a good and future prices we have mentioned the future price the WTI future price, future prices agreed upon price where the delivery will be taking place in future and spot price is the current market price.

So, we have plotted the crude spot price across the world see the Dubai price, the Brent Nigeria and WTI and we can see how the price has moved over time ok.

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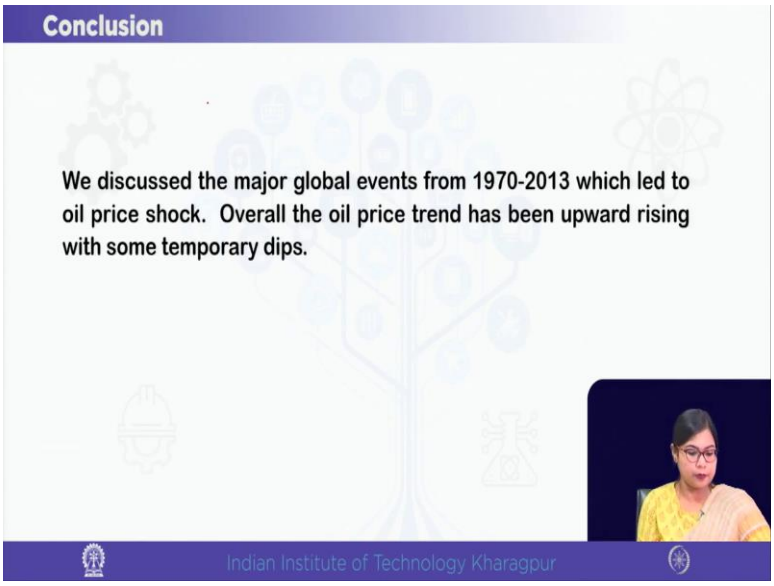

So, in today's lecture what we have done is we started from the beginning of the oil industry in 1860's and we saw that the oil price moved in a more or less similar or more or less in a range. But from 1970 onward there is increase in price of oil; so, we started explaining the oil price movement from 1970 onward. So, we saw there are geopolitical events and we also found out that oil price declined during the phase of great price collapse.

And again, the oil price how it affected due to economic events like the Asian currency crisis or the commodity boom period of 2005 when the oil price increased and the increasing price trend continues till 2011-12. But in the next lecture we will be discussing that increasing price trend also suddenly got reversed due to the shale oil revolution.

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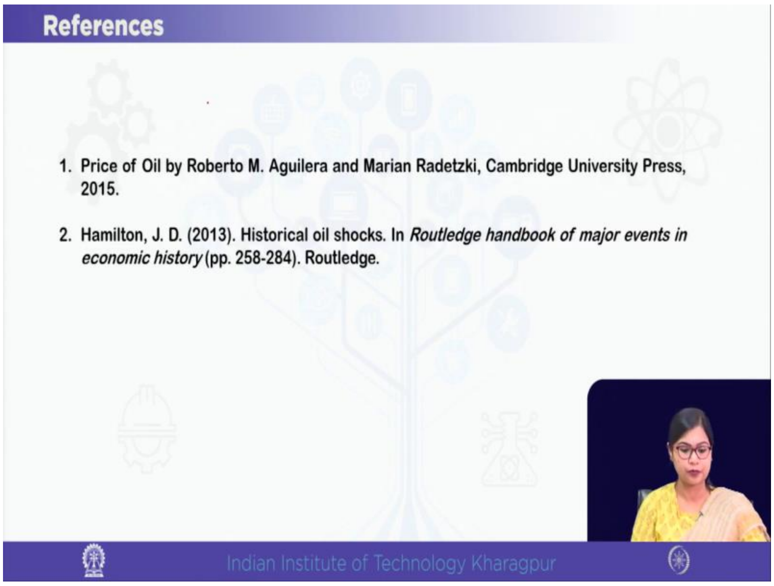

So, these are the two main references used for today's lecture; so, Price of Oil book by Aguilera and Radetzki and the paper by Hamilton. So, we have greatly followed the paper of Hamilton to discuss the major global and local events on oil price.

So, thank you. With this we finish today's lecture.