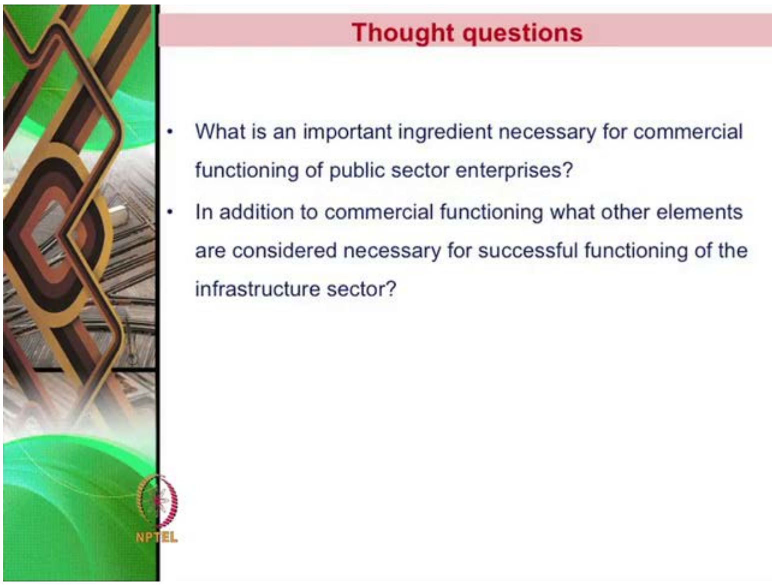
Infrastructure Finance
Prof. A. Thillai Rajan
Department of Management Studies
Indian Institute of Technology Madras

Lecture - 37
Context of Infrastructure Development

Hi, welcome back to this course on Infrastructure Finance, we will continue our discussion on trying to understand a little bit more about the Context of Infrastructure Development. In the previous lecture, we had looked at some elements of the context of infrastructure development, we will try and continue the discussion in this lecture as well. But before we actually do that, let us try and spent some time discussing the two questions that we had at the end of the previous lecture.

(Refer Slide Time: 00:53)



So, question number 1 was what was the important ingredient necessary for commercial functioning of public sector enterprises. So, the first thing that we talked about is, in the in the context of infrastructural development we said that enterprises that are involved in providing infrastructure services should be actually functioning in a commercial manner. Because only when they are able to function in a commercial manner, will they be able to provide good quality of services and more importantly, they will also be sustainable in their operations.

Now, one of the major ills that we see in developed countries is that, most of the entities that actually provide infrastructure services, they do not operate on commercial lines. So, to that extent, the performance of this entities degrade over a period of time. A typical case is, let us say for example, the Tamil Nadu State Electricity Board, so once upon a time, Tamil Nadu State Electricity Board was considered to be an entity that was actually having surplus capacity to meet the demand.

But, over a period of time, there is not been adequate capacity that has been added, but at the same time, there has been so much of new connections that were given, most of it at prices that were lower than the cost of supply and this led to an increase in demand. So, it result in a situation, where the demand was higher than the supply and this resulted in the organization being having a situation of power deficit. So, these kinds of situations are rampant, we can see several such examples in the Indian context, particularly in the context of infrastructure.

So, to ensure that, the organizations are functioning in a good manner and their operations become sustainable, all the enterprises should actually function in a commercial manner, they should actually have a commercial orientation. Now, what is important to ensure that, the organizations function in a commercial manner is it the fact that, there has to be a lot of political commitment and backing behind the commercial orientation.

Unless there is very clear political backing, it will not be possible for the organizations to actually sustain the commercial orientation, because most of this infrastructure provision is in a way inclined with development. And since development is a priority of the government, most of the time the government uses these infrastructure service providers as a way of providing a development across different sections of the society. So therefore, the government has a very, very close linkage with many of the infrastructure providers.

And if these infrastructure providers will have to function commercial manner, there has to be strong political commitment. So, we talked about this political commitment in one of the earlier lectures as well, where I was giving the example of the Orissa power sector reform. In fact, I did a detailed study of the Orissa power sector reform a few years earlier and during the time, I was actually having an interview with a dignitary from the

World Bank, who actually was overseeing the power sector program of the World Bank in India at that point in time.

And according to him, when the World Bank decided to support the reform program in Orissa, an important commitment behind the World Bank decision was, the communication that the chief minister of Orissa had sent to the World Bank indicating the firm political commitment, the support of the government in introducing commercial principles in the Orissa power sector. So, I am just trying to reinforce that, political commitment and support is very important. But then one should also understand that, commitment in a plain piece of paper might not be adequate to funding organizations.

So, usually this political support and commitment is actually shown in a way, in terms of some firms steps, which cannot be easily reversed. So, for example, if the government is committed towards commercial functioning then the funding agencies would expect the government to implement some steps, which cannot be easily reversed. Again let me give an example of what happened in the case of Orissa, when the state was embarking on a program of power sector reform, the chief minister gave a letter of commitment.

But, before the actual investment, before private participants can actually come in, there has to be a series of steps that were taken to ensure that, the government does not easily go back on it is commitment. So, the first thing was to actually enact, what is called as a Orissa electricity reform act, so this reform act was actually passed by the state legislature and then it was later on approved by the president. So, this reform act clearly specified that, the sector would actually function on commercial principles and it will also envisage setting up some of a regulatory agency and so on and so forth.

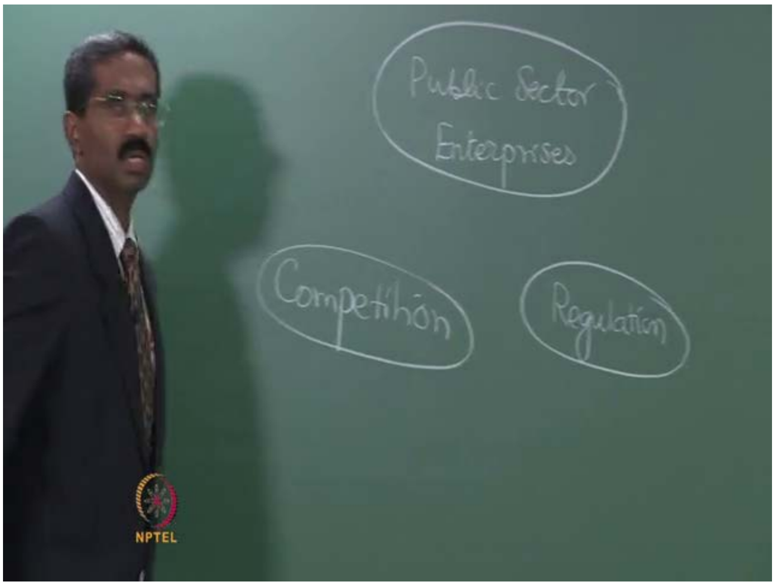
Now, once we actually have an act that has actually been approved by the legislation, which is actually again got the assent of the president of the country, it is going to be very difficult for the government to go back and revert to it is initial ways of running the organization as a part of the government. So, these are all some steps that cannot be reversed easily and such steps indicate the political commitment. Similarly, we can talk about an example in the aviation sector, originally the airports construction and operation of airports in India was vested with the government of India.

And the airports authority of India was the only organization, which actually had the responsibility to carry over the construction and development and the operation of the airports. Now, when India opened up the airport sector for private sector investment, there has to be a separate legislation that is needs to be created, to facilitate operation of private sector airports. Now, when the government started creating an act, which facilitated development of private sector airports, that represented an important step to indicate the political commitment for privatization of the Indian aviation sector.

Because, an act is something that is created after so much of deliberation, it is accepted by the parliament, it is approved in the parliament and then it finally gets the assent of the president. Now, these are steps which takes a lot of time, but it is not something that can be easily reversed, so that is actually an indication of the political commitment and the support. So, it has to be in the form that is, a lot more concrete, it has to be in a form than just mere assurance given verbally or in a sheet of paper.

So, the second question is, in addition to commercial functioning, what other elements are considered necessary for successful functioning of the infrastructure sector. So, what we initially said was, we actually have infrastructure sector, where there is substantial involvement from the public sector.

(Refer Slide Time: 08:57)



So, you have public sector enterprises, which operate the infrastructure sector and said that, for them to actually provide ensure good quality of service, they will have to be run on commercial principles. And when you are talking about running on commercial principles, what actually happens, they obviously are going to generate surplus cash, it will help them to be sustainable and it will help them to make investments in enhancing capacity and so on and so forth.

So, the commercial principles will actually ensure that, the organization functions a lot more efficiently as compared to, what they were used to in the previous regime. But, this commercial functioning alone adequate, because when you are talking about commercial functioning, we are talking about enhancing the operations, enhancing the efficiency of the existing organization. But, what is the major requirement for the infrastructure sector in developing countries like India today, the major requirement is to creation of new capacity.

So, when you talking about creation of new capacity, we need to have additional sources of capital, because the existing capital, either in terms of internally generated or in terms of budgetary allocation from the government, might not be adequate to meet the demands of the requirements of infrastructure sector. I mean, because of the consensus of physical deficit and how much can government meet all the demands of the infrastructure, there are going to be limitations.

Let us say for example, in the 12th, 5 year plan, the estimated investment in infrastructure is close to 1 trillion dollars. How can the government invest all the amount by itself in infrastructure, when there are so many other sectors that are crying for resources from the government. So therefore, we need to actually get additional resources, so when you talking about getting additional resources, merely making the public sector enterprises to function on the commercial basis might not be adequate.

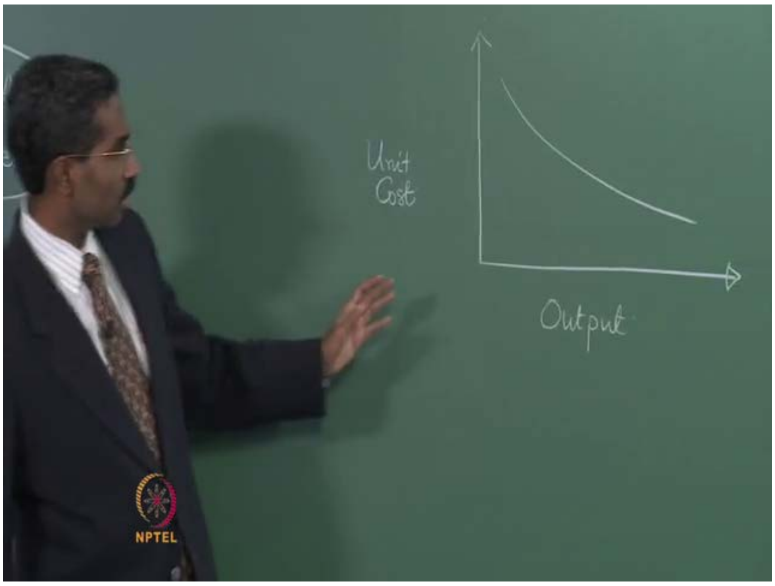
So, we need to have lot more mechanisms, which will help us to get investment from other sources that is, how can we actually finance infrastructure from market mechanisms that is, how can we actually finance infrastructure from the a private sector. So, there are two important things that needs to be done, to facilitate investment from the private sector, which is to actually enhance competition provide for competition in the marketplace and also ensure that, there is regulation.

So, these are the two additional components that needs to be created and this will help us to actually attract private sector investment in the infrastructure sector. So, in this lecture, we will talk about some elements of competition and regulation.

(Refer Slide Time: 12:18)

The traditional view of infrastructure provision was that, it is best produced and delivered by a monopolies that is, we need to have only single supplier or a producer of services and that actually is going to be a beneficial for the economic. So, that was a traditional view, because they all felt that, infrastructure sector is a monopoly. So, what do we actually mean by a monopoly, so monopoly is that, the unit cost actually reduce with increasing output.

(Refer Slide Time: 12:56)



Let us say for example, we considered a graph, where you have output on the x axis and then we have unit cost on the y axis. What do we actually mean by a monopoly is, as the output increases, the unit cost will come down, so we are talking about a Glyn, which is something like this. So, traditionally it is believed that, infrastructure sector had this characteristic that is, let us say, a power plant with a capacity of 600 Megawatts of power will be able to produce power at a lot more cheaper rates as compared to a power plant with the capacity of 200 Megawatts, simply because of what is called as your economies of scale.

So, one of the main characteristics of monopoly is, what is called as your economies of scale, another way to really discuss this is also to look at in terms of the marginal cost. So, marginal cost is the cost of producing the next additional unit, is going to be lower than the cost the previous unit. So, when you actually have a marginal cost, the declining marginal cost, that actually means that, there is economies of scale. It also kind of indicates that, there is a monopoly kind of a situation that is prevailing.

So, in addition to economies of scale, which actually encouraged monopolies, people also felt that, infrastructure services had what is called as economies of scope. So, economies of scope indicates that, it is cheaper for a single provider to produce and deliver two or more services jointly than by separate entities. So, if a single organization can provide more than one service, that will work out to be cheaper than separate organizations providing this services separately.

So, the cost of provisioning is lesser, if there is a single organization providing this service, so these were the traditional views of infrastructure sector. So therefore, what is need to be done, because of being a monopoly, it is better if the government actually is involved in the provision of services, because a private sector monopoly can actually abuse a position that is, he can actually produce more. But, at the same time, he will not pass on the lowered unit cost to the consumers.

The private sector monopoly can still sell product or the service at a higher price, so that is abusing monopoly position. So, to avoid this kind of monopoly abuse, the government was a sole supplier, because it is always felt that, the government will not recourse to abuse of monopoly power. And so therefore, the government should be involved in providing infrastructure services or if there is a private sector monopoly, the private sector monopoly has to be a closely regulated.

In the sense that, there has to be a regulatory body, which ensures that the private sector does not exercise it is monopoly power, it ensures that the customers are benefited, it ensures that the quality of service is adequate and so on and so forth. Remember, when there is a government agency involved in the provision, there is no need for a separate regulatory agency. Now, the government is it is own regulatory authority and therefore, there was no necessity to actually have a separate regulatory authority.

In fact, if you really look at it, for several years, when the government of India used to operate the aviation sector airports authority of India, we had basically the DGCA, which is the Directorate General of Civil Aviation, which is a regulatory authority. Practically, that is not really having much of an impact in terms of airport functioning. Similarly, when you actually had state electricity boards, which are vertically integrated entities and the state government was involved in supplying electricity, there was no need for a separate state level regulatory agency, so this was a way in which traditional infrastructure functioned.

(Refer Slide Time: 17:35)

So, what is a new consensus, the new consensus is, it is not only depend on the government, but if you can have much market forces and competition, it can actually improve the production and the delivery of infrastructure services. So, how can it improve the production, it can improve the production by actually increasing the capacity. There can be new investment that can actually coming in by way of private sector investment, so this new investment can actually increase capacity and it increase the quantity of production.

It can also improve the kind of technology that is being used, so for example, you can have superior technology coming in from private sector investment. The third is in terms of delivery of infrastructure services, let us say for example, because of competition, you can actually have higher quality of service, you can actually have service that is at a lower price to the consumer, you can actually have a service that is very efficient leading to lower cost for the supplier and so on and so forth.

So, this market forces and competition can actually play an important role and that is a current thinking. So, to support this, there has been a lot of a development in technology and at the same time, lot of new regulatory mechanisms, which actually makes competition feasible. So, remember, we are talking about introducing competition in a sector, which was considered to be a monopoly sector. That is, it cannot support competition and having one single largest supplier is the most economical and the best way, that was the original consensus.

So, today we are talking about trying to market mechanisms and one of the important ingredient for the success of the market mechanism is your regulatory innovation. Regulatory innovation makes, what is called as unbundling possible and this unbundling helps us to actually introduce some elements of competition and regulation.

(Refer Slide Time: 19:51)

So, what is this unbundling of services, so the main question is, should one company provide all the services, even though all of the segments do not have natural monopoly characteristics. Remember, if a segment has an natural monopoly characteristics, it is better for one entity to provide the services. Because, having multiple suppliers in the case of a natural monopoly, will lead to what is called as wasteful investment and it is not beneficial to the society at large.

So, whenever we have conditions that have natural monopoly characteristics, we need to really have a single large supplier. But then do all the segments in the infrastructure sector have natural monopoly characteristic, is it possible to actually isolate those segments that do not have natural monopoly characteristics and unbundle the sector so that, we can promote new entry and competition. So, unbundling is a way of actually isolating the natural monopoly segments from those segments, which can actually support a competition.

But, there are lot of pros and cons, there are people who favor unbundling and there are people who argue for economies of scale. So, but we need to take a careful call and then decide, whether unbundling is going to be beneficial or not. See for example, there is one argument about the economies of scope, so the economies of scope argument says that, if you actually have more than one organization providing services separately then it increases the cost of provisioning.

So that means, the end consumer is not going to get benefited, because he actually going to pay more for this services. But, at the same time, when you are trying to unbundle it, you will be able to introduce competition. And one of the benefits of competition is, when we actually have more number of suppliers competing for the customers, it brings in efficiency and the efficiency is passed on to the consumers in terms of lower cost. So, under one hand, you have a cost of provisioning going up, but on the other hand, you have competition, which is actually pushing the cost down.

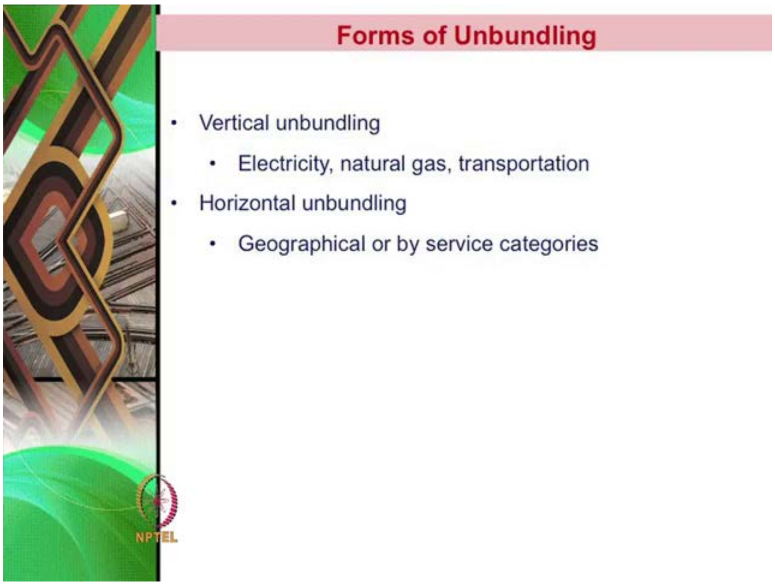
So, we need to see, which one of the benefits are going to be higher, will the cost go up or will the competition pushing go down. If the competition can push the cost down more than it actually goes up, because of the economies of scope argument then we actually have a good case for unbundling. The second argument is, most of the time infrastructure sector has what is called as cross subsidies, so that is, you have one segment, who actually pay more to subsidize the consumption by a different segment.

See for example, water supply to the wealthy might be actually charged more as compared to a water supply for the poor, because water supply is essential for social development and it is essential for overall human development as well. So therefore, when poor people do not have access to water supply, it creates a lot of problems. But, if they are actually asked to pay for water supply at the cost, at which it takes to supply them then they may not be able to access water.

So therefore, the rich will have to bear the cost for supplying water to the poor, so this is called as cross subsidization, so one segment cross subsidizes the other segment. So, when you actually have a single entity providing services to different segments, it is possible to cross subsidize, so that is one of the arguments. But, the proponents of unbundling will indicate that, when you separate it out then it increases the transparency between different lines of businesses.

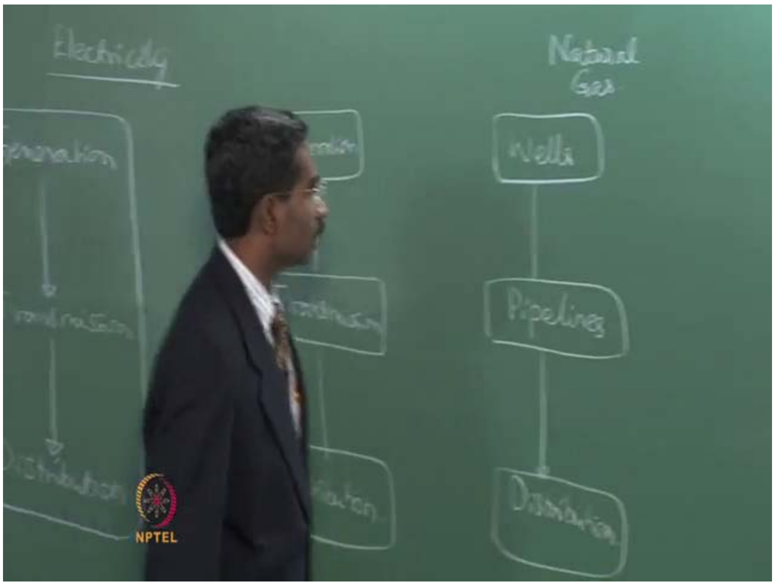
When you talk about integrated entity, it becomes very difficult to estimate, how much of subsidy is actually going to the poor consumers. But, if we actually make it a separate distinct entities then we can actually find out, how much of a subsidy is being paid to the poor consumers and it also helps us to identify areas of inefficiency and then improve them. So, unbundling is not an universal solution, where there are both pros and cons and we need to analyze carefully the costs and benefits and then implement it, only if the benefits are higher than the cost.

(Refer Slide Time: 24:35)



Now, let us look at some examples of unbundling, there are different forms of unbundling. First we can broadly classify them as two categories, the vertical unbundling and horizontal unbundling. So, we will look at some examples in both the cases, first we will talk about vertical unbundling, vertical unbundling I am going to give you three examples, the first example is electricity.

(Refer Slide Time: 25:08)



So, in electricity, so we are talking about, before the unbundling what happens, you have a single entity, which actually has the generation stations. And then the power is generated by generating stations is actually transmitted by the transmission lines. And the transmission lines help to transmit power to the load centers of the consumption centers, so then power is distributed to the consumers. So, you have a state electricity board, which is actually performing all of the three activities, electricity generation, transmission and distribution.

So, when you talk about unbundling what actually happens, now if it is in a single entity, in an unbundling situation, you actually have a separate entity for each of the activities. So, you have generation, where an entity is responsible only for generating power and then you have a separate entity for a transmission and then you have separate entity for distribution. So, from what was a single entity, we have unbundled it to create three different entities, so this is what is called as your vertical unbundling.

Now, similarly we can look at in the case of a natural gas, so what actually happens in the case of a natural gas. So, you have wells and then you have gas pipelines and then finally distribution to the consumer. So, this is actually the flow of gas from the oil generating wells to the end consumer. Now, if all of them are performed by a single entity then it is called as a vertically integrated entity. Now, in unbundling, all this three become distinct entities, so you have an organization, which is responsible only for drilling and extracting gas.

And then you have an entity which is actually the pipeline entity, which is responsible for transporting the gas that is drilled and extracted to the distribution centers. And then you have a distribution company, which actually distributes the gas that is received to the end consumers. So, this again is an unbundled entity, same is the case with transportation.

(Refer Slide Time: 28:17)

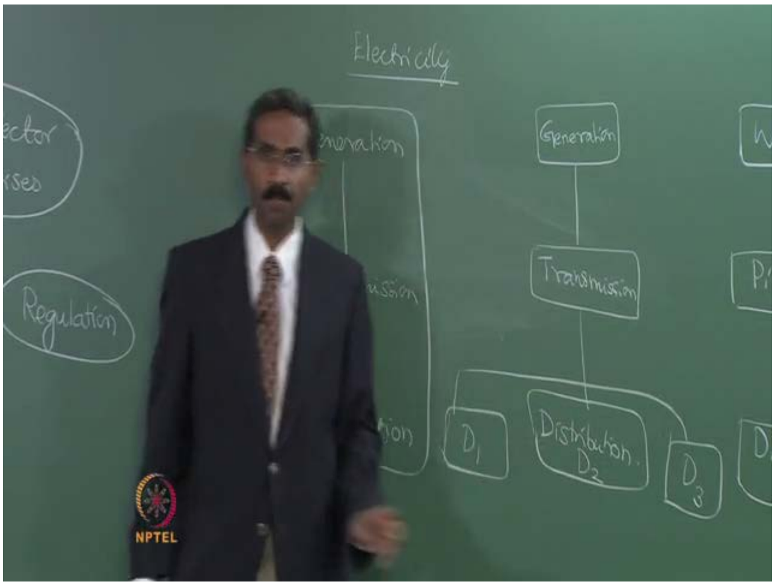
So, let us look at an example in transportation, so earlier this is probably not been done in India, but it is popular in UK. So, you are talking about rail transport, in a rail transport, both in the trains and rail network integrated that is, they were with one and the same organization, so this is an integrated entity. Now, after unbundling, these two have been separate, so you have a separate organization that is responsible for constructing and maintaining the rail network.

So, that is the rails that is actually laid on the ground, this organization is responsible for developing and maintaining that and then there are separate organizations, which actually runs a trains, that run on the network. Now, we can also take an example in the aviation sector, see for example, you actually have, let us say airports, airports could be equivalent of trains in a rail network, in the case of train sector. And then you have rail network, an equivalent of rail network could be actually airports.

So, originally the entire airport and civil aviation was with the a public sector, so you had Indian airlines, which was the only airline operating in the country and then you have airports, which was actually operated by again the government. So, today we have actually separated it out then you have airports authority of India, which is actually providing the airport services and then to different flight operators. So, today you have several fight operators, might you have many private sectors and then you have the public sector as well.

So therefore, now this is a case of unbundling, now let us look at some examples of horizontal unbundling. So, when the bundling happens in terms of geographies, or by service category, that is called as horizontal unbundling. Let us say for example, in the case of electricity, you have generation, transmission and distribution. So, distribution is for a particular region and if this is further divided into different distribution entities then that is a case of a horizontal unbundling.

(Refer Slide Time: 30:56)



Let us say for example, what was originally a single distribution entity, after unbundling, it is been divided into three distribution entities. So, let us say distribution entity for region 1 and distribution entity 2 for region 2 and distribution entity for region 3. So, this process of separating a distribution entity into different geographical regions is called as your horizontal unbundling. Another way of horizontal unbundling is also by way of different service categories.

Let us say for example, you have earlier, in the case of a telecommunication you have, let us say the same entity providing mobile telephone, landline telephone and the long distance telephone. Now, if you can actually create a separate organizations for providing mobile telephony and separate organization providing landline telephony or local telephony and then separate organization provided for long distance telephony, that again is a case of a horizontal unbundling. So, when you talk about unbundling, we talk about either a vertical unbundling or we talk about a horizontal unbundling.

(Refer Slide Time: 32:11)

We have unbundled it, after that what, what do we have to do after unbundling, why do we actually do unbundling at all. So, we do unbundling essentially to isolate those segments that have natural monopoly characteristics and those segments, where competition can actually support, we are able to introduce competition. So, next step of after unbundling is to introduce competition in those segments or in those organizations, they can actually support competition.

And why do we actually increase introduce competition, because there are several studies that prove that, competition can actually improve efficiency and also increase new investment. Remember, the need of the hour in countries like India is, we need more investments, because there are so many people, who are not having access to infrastructure. And if we have to provide them access then there is a need for capital and this capital can come only from new investment.

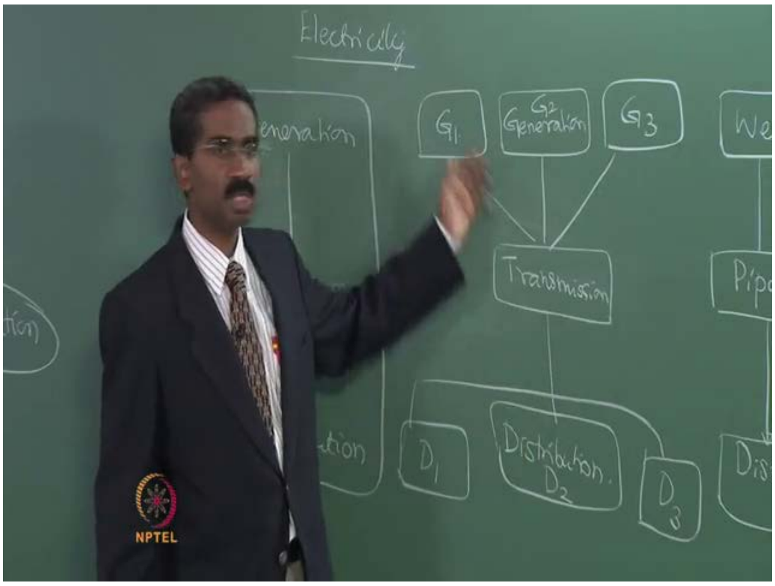
Internally generated capital might not be adequate to meet the needs or if you actually expand only from internally generated capital then it is going to take a fairly long time to provide services to a large number of people. So now, we have said that we going to introduce competition, so what is a kind of competition that we are going to introduce. So, largely we can look at competition in terms of three categories, one is competition from substitutes.

So, we can provide alternates to the consumers, so for example, in the case of transportation, the consumers can have different alternate modes of transport. So, today if you look at in Chennai, there is a lot of investment happening in constructing a metro rail facility. So, metro rail facility is, in addition to the existing forms of transport such as the urban train then you have the road transport and so on. So, we are actually trying to create competition from substitutes, so that is one form of creating a competition.

The second form of creating competition is, competition in the market that is, there are different players who are trying to compute for the consumers that are available in the markets. So, today if you look at, let us say traditional consumer good, so each and every category has so much of competition. Let us say for example, if you actually take the category of soaps, there are so many manufacturers, who produce soaps to meet the needs of the consumers, so there is lot of competition in the consumer goods market.

So, if you really look at television market, there are so many producers, who are competing for the market. We may not really have that kind of heavy competition in the infrastructure sector, because by it is very nature, it cannot really support such a very large number of competition. But, wherever possible, we can actually create competition and impose some kind of a discipline on the market players.

(Refer Slide Time: 35:21)



Let us say for example, in the case of electricity sector, generation is something it can actually support competition. So, when you talking about supporting competition, we can have multiple generators generating power. So, you can have G 1, you can have G 2, you can have G 3, so we can have multiple generators generating power and then they are supplying to the end consumers using the transmission network. So, end consumers now has a choice in terms of, whom is he going to purchase power from, so he is actually going to purchase power from the cheaper source.

So, there is certain amount of competition that is possible in the market, so one of the features that make this competition possible is, what is called as the theory of contestable market. Sometimes, you may not actually have substantial or very strong competition but then the existence of potential rival suppliers, that can contest the market, limits the limits of monopoly abuse.

Let us say for example, you know there are only limited number of suppliers, but if they actually start abusing their market position, you can actually have competition coming in. So, it is not the actual competition, but the threat of competition can actually play an important role. If there are somebody who is making excessive profits then the new companies can actually come in to ensure that, the existing players do not profit from such excessive profit making, so this is called as your theory of contestable market.

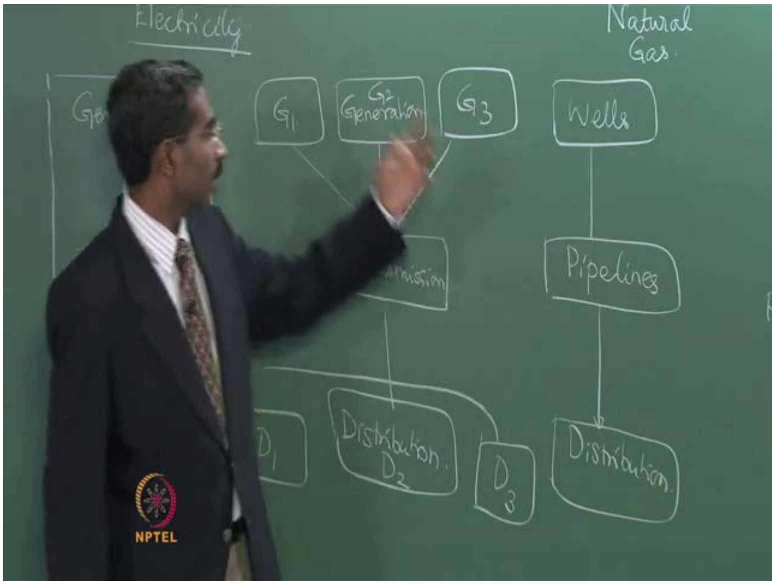
Now, particularly when we actually are able to minimize the entry cost and the exit cost, so if an investor who wants to make an investment, is able to make with very very low entry and is able to exit at very, very low cost then there is actually a contestable market. Whenever a situation arises, where the existing players are taking advantage of a limited competition, new players can come and ensure that, such surplus returns are not continuously realized by the players in the market.

So, the third category is a competition for the market, remember earlier we talked about competition in the market that is, there are more than one player trying to meet the needs of the consumers. And competition for the market is different from the earlier category in the sense that, here firms do not compete for consumers in the market, but for the right to supply to the same market. So, let us say, let me give an example of a parking space, so government or any institution leases out the parking space for a particular period of time.

So, during the least period, the person who is actually got the lease has the right to operate the parking facility and collect parking fee from those who are using the service. So, for it, the period of the lease, there is just only one person, who is actually operating the facility, so there is no competition. But, when the lease is coming up for renewal then there are several players, who can actually apply for the leasing contract, so that is called as the competition for the market, they actually compete for the right to supply to the market.

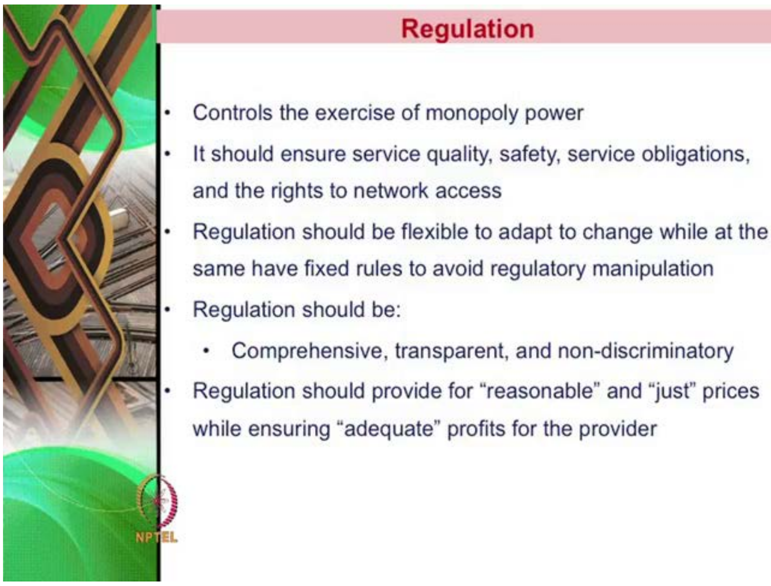
So, though there may not be actually discipline in the market functioning, whenever there is the contract being thrown open for renewal and so on, there can actually be competition from potential suppliers. So finally, we introduce competition in various forms and then finally is, we also talk about privatization of monopoly.

(Refer Slide Time: 39:31)



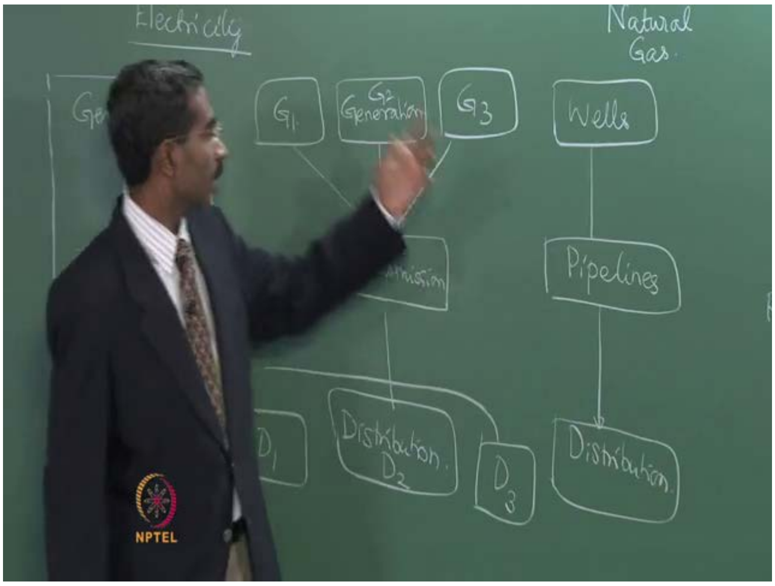
So, remember we are talking about attracting capital, so can we actually attract private capital, because a private capital can actually help us to make new investments. So, can we actually have privatization of transmission companies, we can actually have privatization of pipelines. We can have privatization of, what was earlier the public sector generation entities, we can actually have privatization of gas distribution entities and so on. So, these are all various ways, in which you can attract private investment.

(Refer Slide Time: 39:56)



So, along with all of this, we also need to create what is called as an appropriate regulatory structure. A regulation ensures that, there is somebody who controls exercise of a monopoly power, so that is the first thing.

(Refer Slide Time: 40:16)



Let us say for example, you have a transmission entity that has actually been privatized and the private entity, the transmission is actually, let us say a monopoly, it actually has supports natural monopoly characteristics. So therefore, it is not possible to actually have competition, so when you privatize a transmission entity then it is possible that, the private sector could abuse this monopoly power. Having a regulatory authority, will ensure that, such monopoly powers are not abused, same is a case with distribution entities.

Now remember, distribution entities can also not support competition, because it has characteristics of monopoly, it is better to have a single distribution entity, rather than multiple distribution entities in the same geography. So therefore, to a certain extent, distribution entities also geographical monopoly, so if the distribution entities are privatized, it needs to be ensured that, they do not exercise the monopoly power. So, we need to create a regulatory authority, which will kind of ensure that, the private entities is actually not taking advantage of the monopoly situation.

Obviously, the role of a regulatory authority goes beyond just the controlling the monopoly power, it should also ensure that, on there is service quality and there is service obligations and there is a rights to network access. Let us say for example, you actually have a private investor, who is generating power and they will be able to actually sell the power, only if they actually have access to the transmission capacity. So, if there is no transparent regime, which ensures access to transmission capacity then this entire investment made in generation capacity might actually go waste.

So, regulatory authority will ensure that, there is a level playing field for all those, who have invested in the sector. Now, one of the characteristics of the regulatory authority should be that, the regulatory rules should be flexible, because the industry is continuously evolving. What is important at one stage might actually may not be so important as industry evolves, so we might actually have a new dimension that is coming into picture.

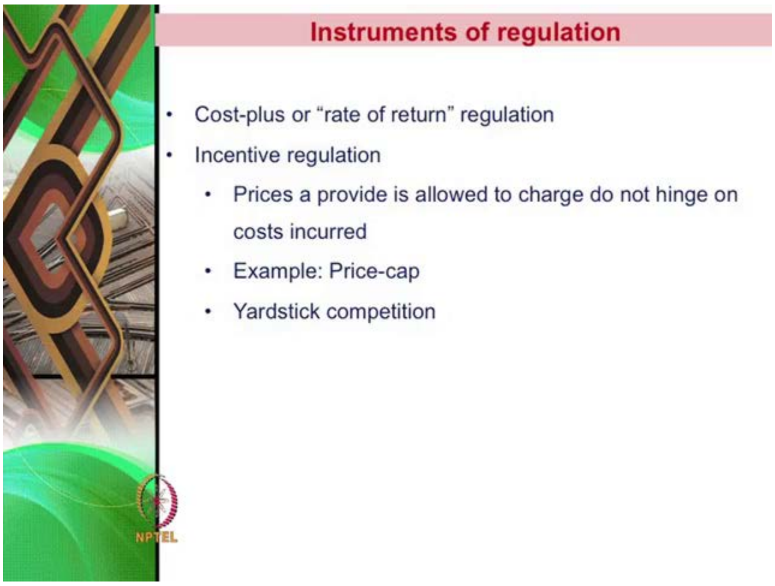
So therefore, the regulatory rules should be framed in such a way that, they are flexible and they are adaptable to change and at the same time, the rules should also have certain amount of fixed component to avoid regulatory manipulation. So, we need to actually reduce the discretionary element in regulatory regime and that is possible, only if you have fixed rules. So, there has to be a fine balance between fixed rules and at the same time, the flexibility.

What should be the main characteristics of regulation, three things, one is it should be comprehensive that is, for all situations is possible, there has to be appropriate regulatory features and it is to be transparent. So that means, there has to be a well documented procedures on how a particular situations are going to be dealt with, well documented procedures in terms of how the tariffs are going to be fixed, well documented procedures in terms of how the concessions are going to be monitored, well documented procedures in terms of how the defaults are going to be treated and so on and so forth.

Then, we also need to have a regulatory regime that is non discriminatory, remember we are talking about several sectors, where we are going to have both the public sector and the private sector organizations working together. Let us say, today if we look at the Indian telecom sector, you have the public sector entity, which is BSNL and then you also have several private sector organizations. So, the public sector entity has been providing telecom services for a long time.

So, by virtue of being an incumbent operator, they obviously have lot more foot hold in the industry as compared to new players. So, to ensure that, they all get a level playing field, regulatory plays an important role, it should not be a discriminatory. Also the important thing about the regulation is that, consumers should benefit, but at the same time, the supplier should also benefit. So, the regulation should pride for a reasonable and just prices, while ensuring adequate profits for the provider.

(Refer Slide Time: 44:45)



So, you talk about instruments of regulation, there are different regimes, so I will talk about the most commonly used, the most commonly used is what is called as the cost plus or the rate of return regulation. That is, whatever the investment is being made, the prices will be in such a way that, all the costs are met and it also provides for a certain amount of return on the investment made by the private regime, so that is cost plus. So, all the cost plus a certain amount of return on the investment made by the private investor, so that is one of the regulatory regimes.

And there are other forms of regulatory regimes that are more recent and they are called as incentive regulation that is, it gives an incentive for the private investor to be more efficient. So, let us say, if one of the examples of incentive regulation is actually called as price cap regulation. So, every year, because of the increase in prices, obviously the private investor would actually wants an increasing in tariffs. And how should we actually fix the tariff increases and a very good example is, what is called as your price cap regulation.

(Refer Slide Time: 46:15)

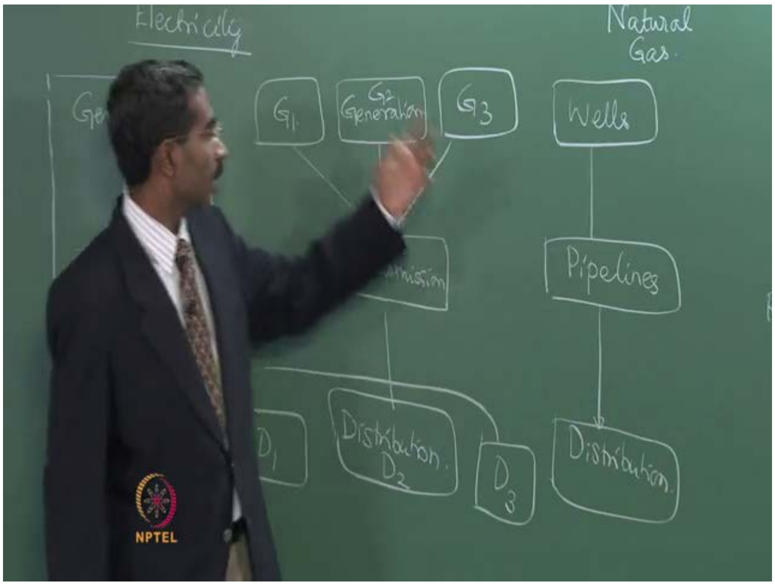
According to price cap regulation, the tariff should increase, the percentage increase, the tariff increase is given by a simple expression called as your retail price index. So, if this retail price index is a reflection of overall increase in cost in the economy then the tariff should increase at the level of the retail price index minus X. Remember, obviously the private investor is also going to make some productivity and efficiency improvements during the period.

So therefore, this X is a reflection of the productivity or the efficiency improvement, so the tariff should not increase at the same level as retail price index. But, it has to be at a tick lower than the RPI and this is to actually ensure that, there is certain amount of compulsion on the private investor to improve the efficiency. Now, if a private sector has been able to achieve efficiencies more than the X percentage that we are talking about here, the efficiency gains goes to the private investor.

Let us say for example, if a private sector has been able to achieve an efficiency gain of 10 percent but then X is only 5 percent, the remaining 5 percent efficiency gain is actually goes to the private investor. So, this gives an incentive for them to be a lot more efficient or more than what is actually provided for in your price cap regime. So, essentially a price cap indicates that, your price is capped, it cannot be beyond this.

But, your cost can be lower than this and whenever you are able to achieve lower cost, you actually gain benefit of that. Another example is called as a yardstick competition, it may not be actually possible to have competition in the market, because of monopoly characteristics.

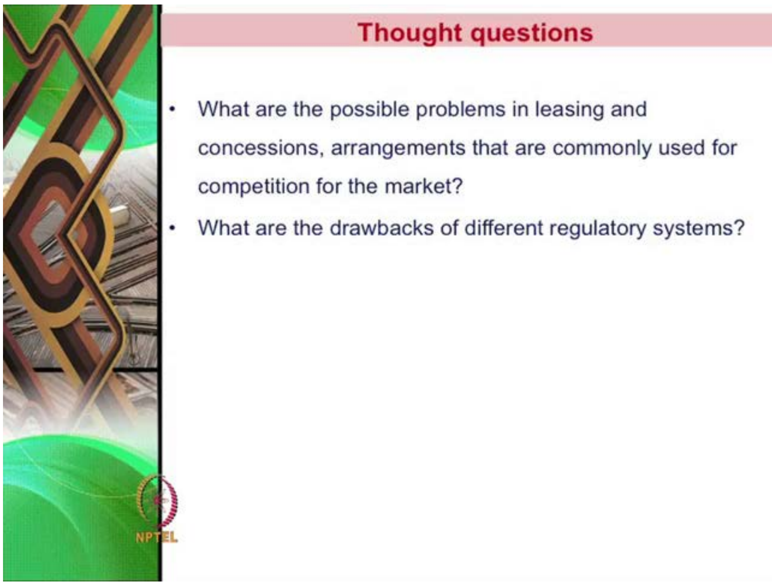
(Refer Slide Time: 48:24)



Let us say for example, you have different distribution companies and since distribution companies are regional monopolies, you may not be able to have competition. So, how do we actually regulate the price, how do we actually ensure how much price should increase from year to year. So, you have what is called as the yardstick competition, where you compare it with other distribution companies.

So, if you assume that, the cost of to supply power is more or less the same in different distribution agencies, the profile of the customers are more or less the same then you can actually use the comparative performance between different entities to decide on, how to regulate the price and the tariff increases. So, these are the different instruments of regulation that is commonly practiced.

(Refer Slide Time: 49:22)



Before we end this lecture, we will have the questions for this lecture, there are two questions. What are the possible problems in leasing and concessions, when talking about the competition for market, the two most common arrangements are leasing and concessions. So, I want you to think about the possible problems in leasing and concession arrangements, that are used to ensure competition for the market. So, the second question is, we talked about different instruments of regulation and I want you to kind of think about the drawbacks of this different regulatory systems. So, we will discuss this in the next lecture.