Macroeconomic Theory and Stabilization Policy
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Lecture – 5

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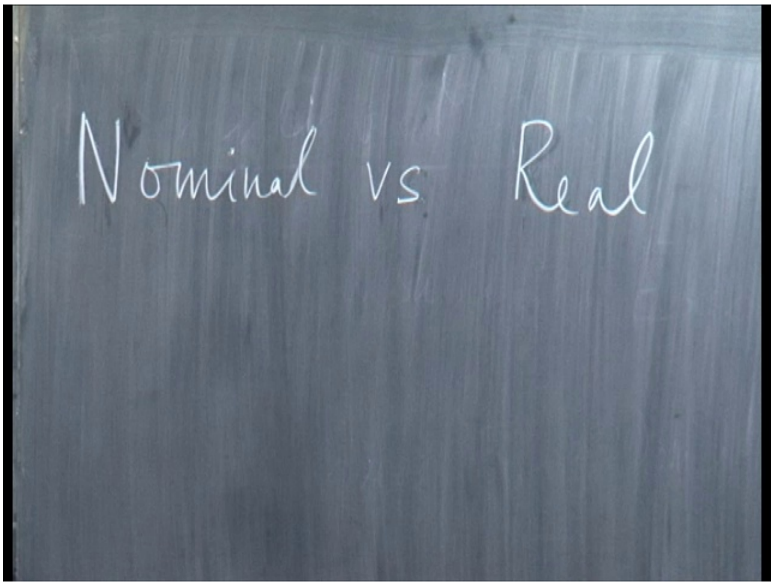

So, I want to know the real value, so he spent 2 kgs of apple.

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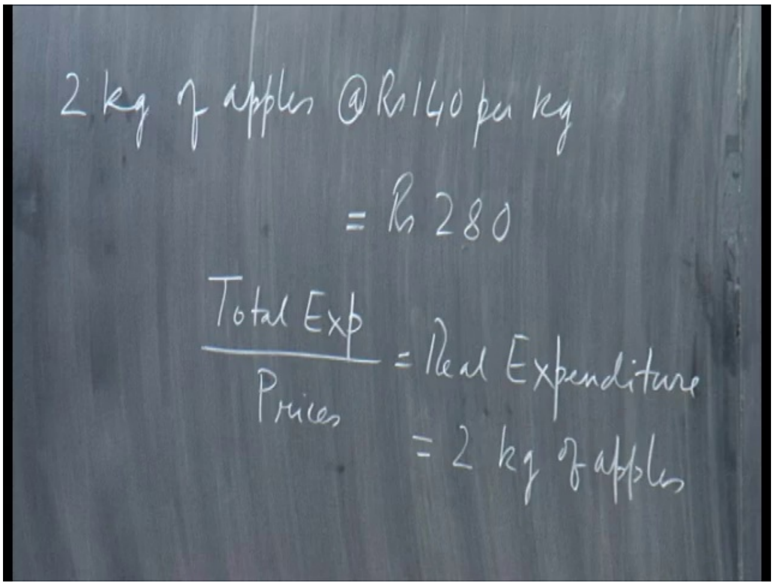

He spent at rupees 140 per kg is equal to rupee 280, that is the nominal income to it and my nominal expenditure. The real expenditure is this total expenditure if I divide it by prices, I get real expenditure or real income from his point of view which is 280 divided by 140, 2 in this case. It is measured in term, so 2 kgs of apple in case of natural income, therefore you can see what I have arriving at, and you need a measure of prices which you would use to divide the national income. You get the real income real national income, so we need a measure of prices; the problem is there are millions of goods and millions of prices.

In fact one good is somebody pointed out in the very beginning whenever I was talking about; we need to add the market price value of goods and throughout the year market price keep on changing. What will you do which market price are you talking about, you have to find out which one decide that, some time they take the average value some time. They take the reprehensive value which is not necessary, average value they think the Ahmadabad price is the most reprehensive one work.

There are prices higher and lower by the workers also the thing that this is the sufficient decision the judgment, the uses we need not get into that point is there are prices and even one good has many prices. So, how would you measure prices, this is what I am going to get into because unless we know prices we cannot determine the real value. Here, to get the real value, we need the prices total expenditure would not have done; total expenditure is like total income.

So, if I have total income of the country, suppose I have national income using the income method or market price valuation of GDP if I have that or market price valuations of GDP. We need to have some measure prices to get the real value, what is your question?

Student: If the prices rise by 30 percent, but my income has not changed, what is the significance of this for real income?

Quite possible.

Student: What is the significant of real variable?

Significant of real variable measure, the real value you are absolutely right, my income remain, the price gone up to real income has gone down. It is quite possible, these are the things we need to know understand, you are absolutely right, the real income did not increase are persons real income is really falling because of inflation that is the macro economy problem. So, do not think it cannot happen I earned the same money income six months back what I used to earn in the six month period prices have been gone up the goods that I have prices. The goods that I buy those buy prices, it may not be the countries price level that cares at an individual level.

Therefore, my real income has fallen because that may be at higher prices of the bread and butter and the rice and wheat that we buy and the vegetables. My real income has fallen, it is correct that is why inflations is worries is that your question.

Student: What is the significance of real income?

Louder.

Student: What is the significance of real income?

This is the significance of the real income, it measure the actual income level what else can be the significance, more significant do you want what more significant do you want regarding real income is true measure of an income. You just do not say as I pointed out 19,000 rupees cablecast made point is actually real term, how much game did he make is significant because with 90,000 rupees. You may not be able to buy the goods 10 years later that bought 10 years back, so that is the significant variables income. Now, what is your problem, that was not the very good question, you were thinking of something do not interrupt me.

There is in discussion hour we take it up you are interrupting me, do not interrupt me if you do not have good questions in discussion hour we will take it up. So, the real income is become very important, so people want to know that in a country national income have grown in rupees terms. I want to know what is the real gain to the country say per capital income have you heard a measure per capital income. It is simple total national income divided by the population sides, now you see the per capital nominal income has gone up good, but I really want to know per capital real income, how much it is gone up.

That would benefit that on an average, it as an a average measure that as mean everybody has gain, but kind of average income how much as it increase in a India real income again, real national income that is the issue. Now, I guess somewhere I have to being this how can I begin this if you remember a few things I said that the few things, I said is a things like GDP or GNP when it is just written, it means it is measure the current market prices that you have heard all. Now, let me tell you a very interesting first a very useful measure a real variable how it is ramp one very common approach to measure real GDP or real GNP is the following one very common approach to measure real GDP is the following.

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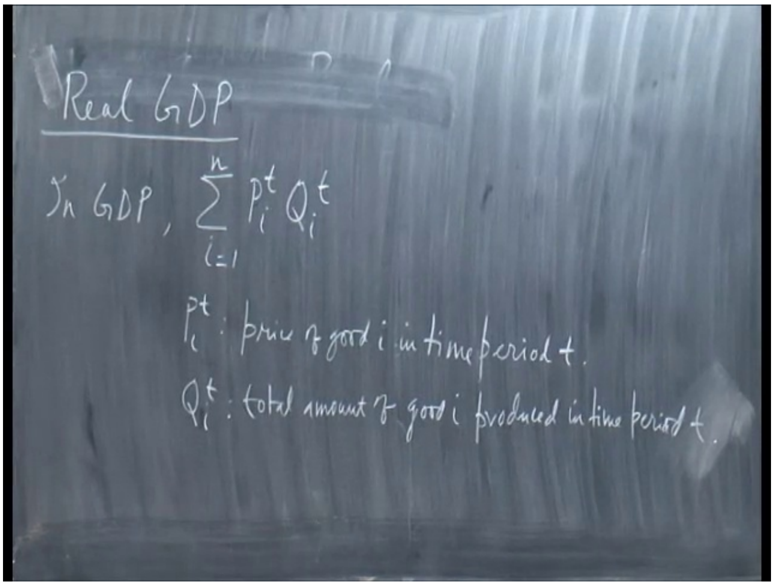

Now, what is happening in nominal GDP in nominal GDP or in GDP what we usually do is the following. If some goods at a particular current time period like this where i goes from 1 to n P i t is the price of good i in time period t and Q i t is total amount of good would i produce in time period t. So, that is what is GDP in the country produce by whoever, it can be produce by domestics companies. It may produce by a foreign companies, this is GDP that what I thought you in algebraic terms, now problem with this is that even Q i quantity remains same, but most price if even if some quantities are falling the prices have changed quite of rate.

Then, the GDP in the next current, next time period will be a large the number Q i remains more all this constants and even some are fall lesser amount produce, but p I is large, this speaking have grown up majority of goods. In the next period, GDP value be higher, this is this is a misleading you, this is the misleading information output in the economy has to grown up overall output, but it shows a large a number.

If you use a method like this in the real value, but current price are involved in the value which is the more significant value, how much the country producing more Indian aggregate terms Indian aggregate sense. Over the years, how much it has produced today more than the previous year, how much was produce in the previous year more than the year before that and how much was produce in the next year compare to this year.

If I have to have a maculate economics data set where I can have a look on a big screen how is Indian GDP value real GDP value in which is actually Indian producing modified. How much is producing is a very simple way we approached that problem, we agreed with would be to keep this prices that is use measure the value alive. So, we cannot add apple or orange, we cannot have number of cars number of they have to be converted to in common unit where you need the money value or something. So, price is happening, but suppose I tell you solution to this problem find out real term, how much more is produced I can do case of one pickle goods we will use.

I tell the case of multiple goods just do not happens millions of producing the country, if I keep the price, but my steel allows me to convert see the volume of automobiles and fans and. Then, to the nominal value, I can add in a common unit, then I saw the publicity because year after year very GDP value would be reflected to overall change in the cube value and what the P is the head constant, this is called using the basis prices.

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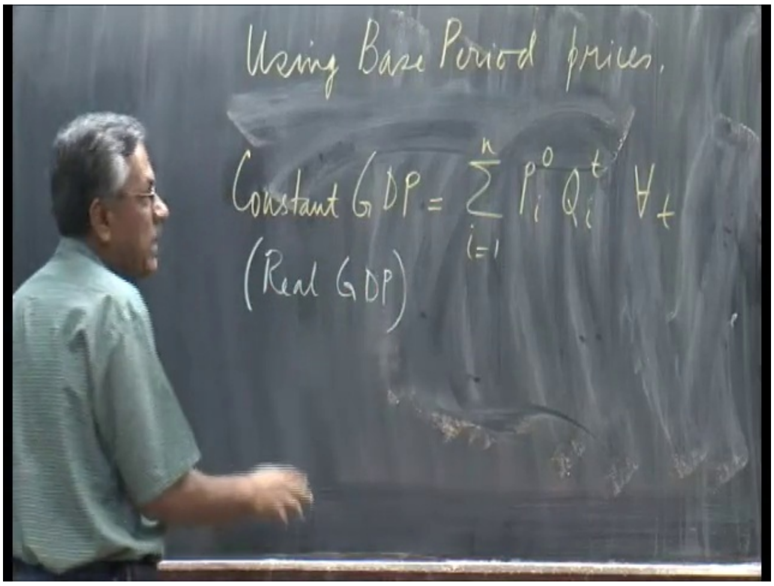

So, use it constant basis for the base period in which we compare the number in future all time and constant, now all goods are still multiplied by the prices which existed in 1993-95, that is also once the data is tried. Then, data period basis I can compute real GDP, one can obtain which is known as constant instant. It is not GDP, I can obtain constant GDP as sigma i equals 1 to n P 0 and then you have Q i t for t overall times. I tell you that real GDP constant GDP and GDP at constant prices are interchangeably used. This is what I am trying to tell you, the multiple course, the real GDP like this, it is low in physical term because this is it is not meaningful.

One happens or origins, but you are this spectacular shirt, watch, pen everything they has to be, but still this is what real life because if you check only the value we have changed over time keep that in mind respective is the physical quantity. We have to defense the real GDP this is called constant GDP and real and this very simple, but very effective which need the prices constant.

So, you have to evaluate goods in the current or any time period, how much actually produce in a centre in an industry multiply, why the price are existed this is series and shown on the mega screen. Exactly, how Indian real output or real output whatever and then and in which price is measured has been moving. It has been moved and it is not going to confuse you or misinform you with respect to how much GDP changes, which is very important from the constant, how much more the country is producing has the goods. It is very important, this is what you look at using the GDP, I have said that this is real GDP. Now, I can tell you the first numbers measured of prices is the following method.

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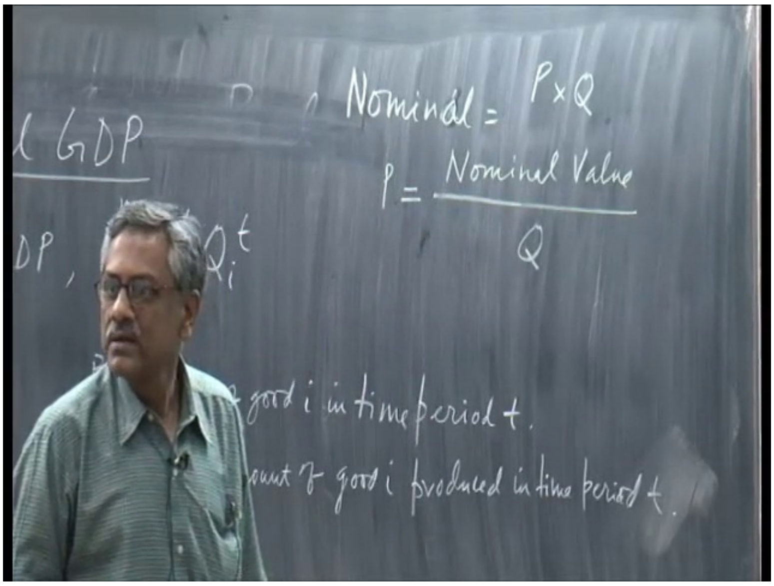

The first measure real GDP, simple example again, if nominal expenditure is equal to P into Q. Then, the theory follows the price the nominal value divided by q cross multiply, nominal value divided by real value. Now, I have real GDP here constant, I have nominal GDP here, so what is the first important letter average price in the country, what is the example prices in the country, price level like in the sea shore at any point of at any particular place of it values. I do not do the point what is the point, now you have various point various heights of wages you want the average wage. You have to find out the total always at any point and form some extra we made, how we can do it? In this case, nominal value is equal to P price good, therefore price is equal to nominal value physical quantity.

What will be the measure of price vertex from this two variables nominal GDP which is current price market price and constant GDP the nominal GDP divided by GDP. You have the measure prices. You buy an analogy by analogy, these two examples, so nominal value expenditure on apple price I report the price of apple; you divide the nominal value expenditure by the amount of apples. Here, when you have the price in this case, we usually have always upwards measure of prices in the country.

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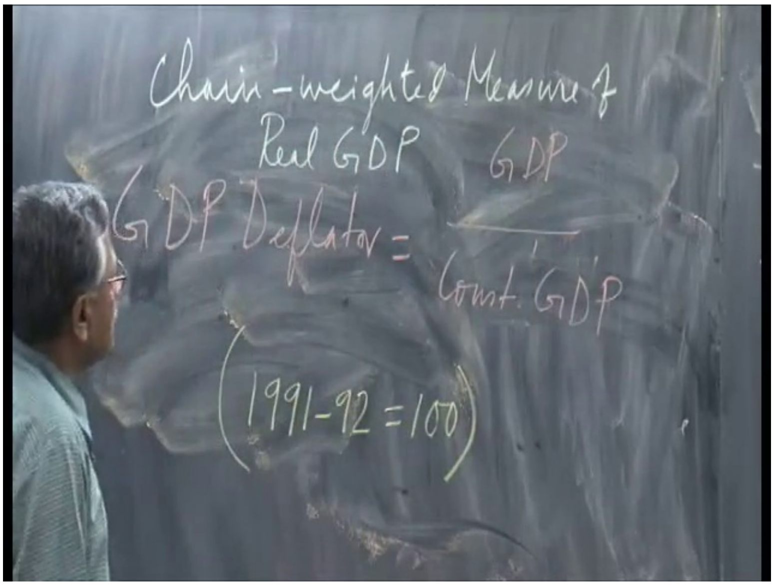

That emerges GDP deflator, the prices that emerges which is GDP which is nominal GDP divided by constant GDP called GDP defect as named what is GDP d. It measures some prices, measure of all prices the one thing you should know, it is this of multiples where we have been discovered method or keep the base time from constant throughout the series. Then, we get the constant GDP and apply, multiply cannot get GDP, apply multiply system, we already have. Then, we have the GDP designer measure the prices in the country, one thing is done, somewhere you see that is different GDP value says you can see.

There may be foot note or a base period price is measured and you know how they mention the price. It is very important by the base crises are if you the base period the price value change you take as the base period, sometimes it existed another GF. Then, you evaluate all output levels to numbers of all output series that is true to the price are different in that year 1994 and evaluate and get if the modern GDP. Then, the whole GDP because of prices are all different although physical quantity are same in all this year prices are different GDP numbers are different the real GDP values.

So, always it is therefore, mandatory to write down when GDP or constant GDP, the real GDP what is what they right is because see this is the way created you have the wave better that is used etcetera. They gone used, but GDP within bracket 1991 - 92 is equal to 100. This is what they will write, what it means physical is 1001 GDP is the value is

GDP is constant GDP is in the base of numbers one this one is actually ninety one make this simple solution multiply 91, 90 prices one is equal to 100.

In fact, you will see some year mentioned is equal to 100, what it means is that year prices have been used as the basic prices. You check that magazines that what is that please check that, how they write, so whenever real values are mentioned all the prices are mentioned respect to the particular set of prices. Otherwise, GDP are current number using the current prices. That is the only we have I made it clear anybody very important thing I wrote.

So, if you look at the basic price, then actually there are been 5, 6 prices, since he depends price initially 40 is the change somewhere between. Then, it changes to 60, 70, 80, 94, now it has changed in some part prices, so it is continuously shifting, if you shift, please give us the back number also because in the back numbers 40 years back are in 1993 or 81 price.

Suddenly, we are using the current numbers, how is it economic if I have research or whatever going to find what is called the between the series. Some numbers are using some series and other numbers last ten years between this is the huge number. Suddenly, it is been shift [FL], these are the data to collect was on the base of one current present is these problem are in the base period. Some product may not have existed, then how will you account for them in the current period coming to it early question, but you know this base period. Now, in US they are not using the GDP different value or measuring GDP this way base 3 price what they are doing every two success year.

They take the average difference again that which does not know pricing bank all the way you getting, they get the average of the year of the current or any year. So, they used what is known real GDP in US, they are using called chain weighted measure of the GDP chain weighted measure of GDP. This is what they used for everything, the prices more than it and number continuously price and they have to current GDP is also GDP. There are two years having the small changes whatever happen GDP, this is what they use, now I come to the question that is the how do we measure and how to measure prices.

GDP can be published once a year once you have all the values of output it takes the long time. So, GDP reflected cannot be published data every week, it is very difficult, so how do we measure prices and therefore, how do we measure inflation in India the way we report there are two forms of measures in India. One is called CPI, other one is called WPI in us the word WPI does not exists in US, it is called BPI what are the measure to consumers price index how do exists and hopes the price index double index in US. Also, price index have another name is called producer price index, so we are going to talk about two most formula prices.

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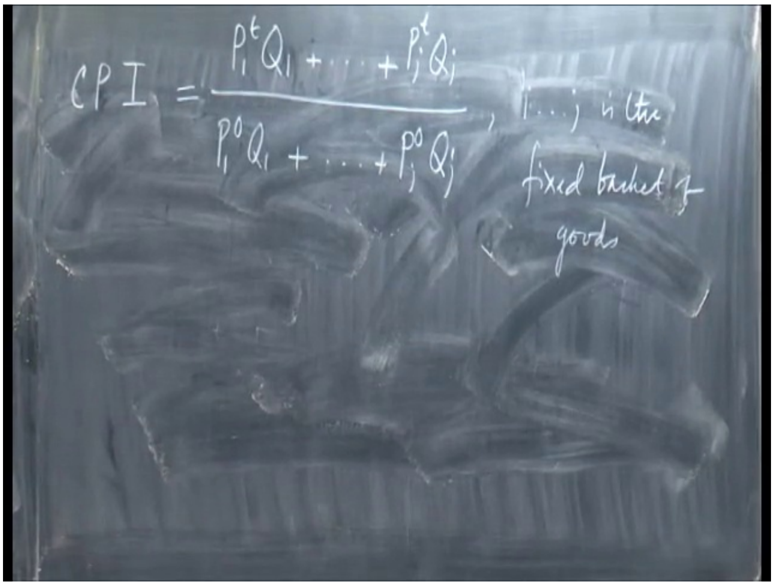

One is CPI, then and talk about another one which is known as WPI consumer price index some people say economic say it actually does not just measured prices it measures the cost of living of individuals. It has the very limited set of goods which are called representative basket of the consumption of average consumer, if that is true, it is the representative set of goods or basket average consumers. There are so many you can ask this question, there can be average consumer go linear change in any constraint, there average consumer of worker industry worker [FL].

They find the average consumer, it is very classic or they thought in middle family average. So, there are so many average consumers, so basket of goods are that we typically consumes in the week or a month or a year or whatever [FL], this much of chemistry what they used whatever goods. So, CPI has fixed basket of goods that represents average consumer in India is so diverse the rural side is different.

The urban side and the urban middle class is so different from what else, so what do you find in India, there are three CPI majors. I can thank Indian government have one for agricultural labor they call a l, then one for industrial worker price of it CPI [FL] and one or the other like US upper income or lower income is called all that. So, these are three CPI, so what they chose to do they find the measure of cost of living that is the price movement of this typical three types of consumers in India which has rich or middle whatever.

So, they constructed the representative baskets of goods that they consumes in terms of quantity and they use the symbol the GDP differences that I used the index number, I approach they use commonly. So, CPI is essential these typical baskets for any consumer group of consumer and what you do is that you measures that in terms. So, one j is the basket fixed basket of goods that the typical consumer same as the nominal divided by real value, in case of multiple goods. The nominal value, the real value in terms of the basic price, but the fixed cost is something.

So, there is no super script, here one going time period change what I do not have done is nothing but the satiation deserves the right to change. The basket consumption that changes and it forms the change physical composition of the basket of a carbon manual or agricultural labor CPI basket and what will be the way does the a bounce the changing. They can also change titans, they can drop some titans include something else I can do that, but that entail is done only by the decision people would like we just look at the numbers.

They do not look into all basket and output has changed how the CPI basket is revolved go out workers in the past 50 years, how I change having the same quantities you want to give change all throughout or q 1 is the different q 1. Now, the amount you want the different amount what is the different amount I have the feeling that urban non manual workers is not living in a city have very different of basket of concerns. When I look at my kids they like food there is I stand over food with me 40 years, 50 years back, I did eat that I had a very good food habit. These fellows at home is what they are happy, there is no chapatti and rice, they are happy, I cannot imagine in dinner or lunch without rice or chapatti food to buy such that they are happy.

These kids would not care, so foods habit has changed CPI baskets are might have change the agriculture labor may not have change. So, that is the very interesting issue, but I am not getting into that, I am not trying to take the conceptual frame of this term. So, same method is used again the base period value would be 100 because you multiplied and this 100 and you get a base period value. The issue is not kept it in term of number which is expressed or not because you have since P 1 t, q naught 2 is the same number into one the presentation. So, they are CPI series are 91 and 92 is a 100 published in India on a monthly basis, so this is the CPI value because these three measures.

Now, I would conclude talking about price index briefly before I go into a comparison I look after that, I just talk about the whole set price, and then going to the whole sale price index the whole sale price index. If you want to look at the items including supply some information as much longer items in a city in India number one is the same method used. Once they have fixed, once they are fixed sometimes they may have a weight q 1 is the type of goods was small you one a weight way make were one or that approved what 100 or whatever how you are express the weight.

So, they may not have so physical quantity method above that the type represent the type of t kerosene q 3, now the weight attached alpha telling in that index in that index price, how much weight is gain, how much involved is important. Depending upon the consumer prices this is such an economic what is typical consumer's preferences of wheat type of oil they use etcetera. They were the various thing is going the wholesale prices index very similar to this accept. They are longer set of number and the consumers detect important is much this is the all as doing consumes there as consumers.

The goods that the consumers are called and then the fuel electricity cost etcetera and then you have a bundle of raw material and semi finished goods of wholesale price and the total list is like 200, 300 items. Everyone has the weight every goods has the weight and weight does not point out, so they are all rated and the weight can change time to time changes WPI. They are adjusted depending upon the important thing, so it would process we should find out what is important in the country and by looking at that has finished goods like CPI for primary goods any were electricity fuel etcetera cost in India.

Then, you have finished a semi finished raw material that means that one means industry producers they are all included in it and whole large longer listed number. It is published weekly that is every week data is collected from various corners and mostly probably as the probably as people fixed it. They report the data on a particular date, they collect the data they know where to collect they have decided already. They have to make the average number put it in the computer to the US computer, but the thing is what is very it is not talking about. So, there would be electricity cost and they will take final goods also food items fruits etcetera industrial goods semi finished goods which industries used assumption.

My assumption not final goods assumption, I got the CPI try to multiply what will become CPI what will be the data remember is not present. So, it is very different WTI letter, so the first I gave to the GDP which will be the same method of limited number of goods CPI, WPI whole sale price index. One thing you have to notice compare to CPI, it includes the number of industrial products just not consumer products, therefore this price index is most relevant to industry, but consumer also pay attention to it. To be honest with you the true price level that is relevant to consumer is real prices, but newspaper etcetera journals the fashion.

The trend is you know the practice is not to report CPI value the cost of leaving for you and me most important CPI value this somebody. Some economic students are doing a project trying to find out this under my guidance means they come and concern me not on the regular guidance bunch of people are doing some projects. They want to do something I said, one of the fellows tow fellows have involve with this on the difference in the numbers coming from CPI and WPI. The government when reports or talk about inflation any discussion on TV on inflation, all is based on WPI value.

That has the largest audience which interest people on a wide scale, but to US consumer the most important inflation or price index value would be CPI whichever CPI is relevant because of that way cost of living, so the question is that WPI. Why this relevant, why one thing includes industrial goods is relevant to industry goods, second this is the very interesting inside into WPI useless. Since, WPI includes semi finished goods and raw materials and quite to bit of it large chunk of it weighted is very high. The largest weighted among the three groups in WPI is probably on this, and then there is disadvantage of using the price index to predict the future.

Let me tell you this way if semi finished product and raw material price are going up quite a bit if the stations observes that and that as the reflection WPI value level. Then, it is indicating, these semi finish goods are raw material which are going to produce finish goods tomorrow will also going to have a higher prices. So, it has the futuristic component a continent it can be used to predict future price changes, CPI not necessarily gives that it is only the finis foods price which may fluctuated for various reason, but in this case the cost of living. If they are going the cost of input raw material cost etcetera are going up, then for sure it can explain expect in future prices finish good will grow up.

There will be upward pressure inflation, so many economist say WPI is more useful than CPI, but CPI is more useful to consumer to us, so I am concerned CPI, most relevant value. So, whole sale price is index whole sale price index is a very interesting thing, it has the futuristic component, it can be used through to predict the future what is going to happen. It has so much of importance to semi finish goods and raw materials that if there is measure change is in prices, then WPI would reflect that today, but also it is telling tomorrow is going to be more price increase. This semi finishes goods raw materials would convert and finish goods whose prices also will be higher naturally simple logic.

If cost are higher, the producer also raise the market price, but now I want do a comparison between CPI and GDP well you are absolutely when you say somebody pointed out that a GDP a base period price concept has some problems. I am coming to that, first of all note that CPI compare to GDP is a discretion advantage because CPI is selected, the very smalls of set of produce that are produce in the country which interest the consumer. So, it has a very narrow objective to word serve the consumer and that to they fix it year after year.

When they get the numbers well consumer reference chanced as I told you if you take a long run view of 30, 40 years in my life for instance as I have seen consumer preferences for instance shifting different kind of food have been etcetera. For loading reference, for instance we use to go to Cinema Theater, you use to fight in the line get a ticket, you want get a ticket stands in the line for 2 hours to get into movie theatre, who does it today only. Anybody does this no consumer preference the sit at home watch TV. They get a DVD, they get everything pirates cassette have DVD has floated the market any film which is released the immediately pirates staff is out, I have seen preference are shifted they goes to mall this days.

I never seen a mall in my life until recently, so GDP is much useful because GDP take all goods into consideration and if you talk to talk about prices taking all goods into consideration is the wonderful thing. Then, considering a very compensate price index compressive major prices, so many people like GDP, the problem is since GDP includes all goods where is the time to collect the data or all goods it takes the long time to take to collect the data. When you talk about CPI in any countries, the matter of fact there is no restriction on CPI to include imported goods because consumers like it imported goods you take an African country, some country.

When they do not produce enough most of the things are imported if you take the small country in Europe symbols Luxemburg for instant one of the richest country in the world small country. They do not produce everything, they import more bulk things their CPI would include imported goods, but if you talk about GDP reflector, GDP is all goods produced within the country, these no imported content. So, imported goods would not be there remember is another different that is coming, now the other point which I have already mentioned the CPI is fixed and the GDP reflector is ready because every year how much is produce taken into consideration.

There is something which is very important suppose there is to be CPI good number n or j which has now disappeared from the market this year. There has been the crop failure; however some amount of that output is still in the market on the shells because somebody holed it. They have been sold the in the high price basically crop is not the market, there was the crop failure the item is there in CPI because of fixity awaits. You cannot remove it and normally high price is not measuring typical consumers consumption if normally high price are there consumer is not typically consuming.

It is not there in the market, some rich people playing high price is alright say apples, there was the apple has huge amount of there was the consumers preference. When it is normally available, but if there is the crop failure a few basket available sold at a very high price. It is not the typically consumer basket in case of GDP apple would not show there crop failure thing, but in case of CPI since you fixed it and you do not change. It will distort the price movement of CPI basket is another disadvantage of having fixed rate in typical microeconomic theory.

We also say that when price is change when the price is change consumers have the substitution effect where the substitution effect is, if prices of apple go up to much consumers would look for substitute food product. Then, I go for bananas orange, even if they do not like that much in winter, they will look for apples, but apple prices are too high. They will substitute away, but if you fix the weight consumer preferences are not reflected these changes seasonal changes yearly changes. It is the consumption basket because the weight of fixed CPI is not a good measure; they will not reflect the substitution effect. Now, I come to this point, there are 1980-81 for instant when I was coming out university and trying to go for higher studies.

Around that time, there were no computers in India, so I remember how nervous I got when I first saw the computer and I was given the assignment of the computer. I have seen a computer I was asked to do the assignment on computer, how that I am going to do, anyways those used to do. Now, imagine Indian output, no computer sold base period is 1990 s when computers have come has entered in the market place what price I am going to use to compute the real value of GDP because in 81 there was no computers, but there were reporting numbers.

So, what they do is the question you had you were good exist in west period, but now it exist and they would try to look for an international price convert that into Indian currency price looking at similar goods if international price is such and such. So, much demand of preference in the country what is the drafting Indian price which is the close substitute in case of computer is possible, but in case of some other case, it may be possible which existed in India those of that auto mobile what price would have been there. So, statistician problem GDP conceptual frame talking about a lot, but the statistician really has the final stage and also has the night mare of crunching the numbers out these variables.

So, many compromises, so many assumptions, so many difficulties he has to finally get the numbers for you, which we look at and say inflation is going up India, inflation is good not such a bad number of after all. To come to that point, you many have that there are many problems with these variables final point neither GDP nor CPI neither GDP nor CPI. I take into consideration the qualities changes that as taking place, they only look at the quantity that are produced a quantity is demanded how about the qualitative changes taken place, TV used to be like this, TV price are fallen as quality has fallen.

When Quality has gone up, TV price are fallen does not means the TV has become less, so qualitative changes in variable. So, what will you do in when the quality changes, it is very difficult they do not accurate? So, they price level measures real variable measures very crude still they have to make many assumptions the problems that just I pointed out some case fixed goods basket are there. In some case, goods does not exist in the base year some case qualitative changes are taking place in some cases there may be entire crop failure the product is not there in the market, but just because it is there in the few the shops. The prices sky rocketed are and some consumers are buying, it will distort the numbers and still enters unless force fully you will take the number out.

All depends upon the statistician preferences to small point I am finding a variable to sit here, therefore what is inflation rate any rate how will you calculate CPI value WPI, CPI GDP deflector. What will be the inflation rate, what is the simple arithmetic measure, simulation rate, how would the inflation rate measure percentage change in prices, why is no answer there how is the growth rate is measured. How did I say the growth rate measured, how is the growth rate of the variable measured, y t divided by y t minus equal to 100, you can make the percentage change.

So, the inflation rate is how much CPI rate is how much CPI minus t into 100, this is how inflation rate is measured in India WPI minus today value divide by minus WPI. Yesterday, value into 100 percentage change is same thing in case of growth rate of output growth rate prices and prices have been measured in price level which is price indices consumer price index WPI whole sale price index. Then, you have GDP also price index, this is how would you measure that inflation rate, but remember one thing which people forget was suppose the price of the price of the some goods in year if I draw the diagram.

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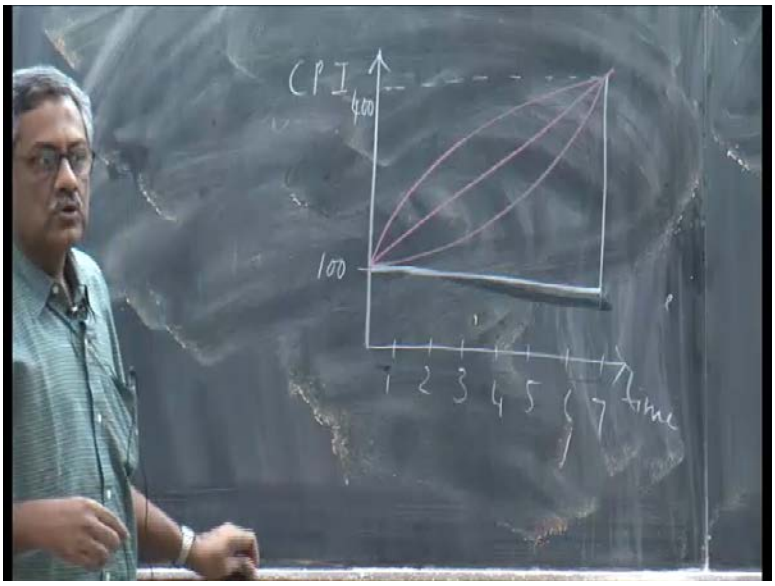

This is the time period, and suppose CPI value I am measuring, CPI value was 100 here, then for one time period to 1, 2, 3, 4, 5, 6 and 7. Suppose, one time period it remain the same and then in seventh period it went up to a number which may be something like 100 to 200, 300, 400. So, you say this is 400 percentage inflation rate or something or how much it will be 400 minus 300, 300 percent inflation rate. You say what is that is not true because prices are remain constant priceless are remained constant for all this periods.

Suddenly, it has gone up this is not inflation persistence rising prices, so in case of inflation the line price line either like this or like this have reached that point or like this have reached that point over time. So, every period there is some increase in prices either in the concave shape convex shape or concave shape whatever or in a linear fashion. It can also go up in a linear fashion the price can also go up in the linear fashion prices can go up in the linear fashion.

So, come to that point, then you call that inflation, so persistence change in prices upward is inflation change persistence is change in down ward if they falling they called deflation, one is inflation. If it remains constant for a while the choke and then suddenly jumps to the same height I am talking about the same height, it jumps inflation that is how one short increases in price the two short increase in price. That is not called inflation, so in India will be talking about inflation, if you notice is the persistence increases in prices that you called inflation what you call one time increase in price one shot change in price one time change in price or something 300 percent, 200 percent whatever that is not inflation.

So, when India talks about inflation is a problem you will see that the talk about the positive inflation rate every period no period is 0, 0, 0, 0 and suddenly 300 percent. Every period they are talking about 7 percent, 8 percent and 12 percent, 13 percent increasing prices nonzero increase that is why they talk about inflation as problem. Every period there is nonzero change in price a positive point may be 4 percent may be 10 percent may be 12 percent, 8 percent that percent change may be going up and down, but prices are increasing continuously.

I have CPI measured, this I do not have inflation rate measured here, I have CPI measured here, what I am trying to tell you to this point. This point same change in prices are taken place to n point, but one path is this one the white line the other one path is any of this lines this pink cooler inflation problem in the country because CPI value is increasing every period.

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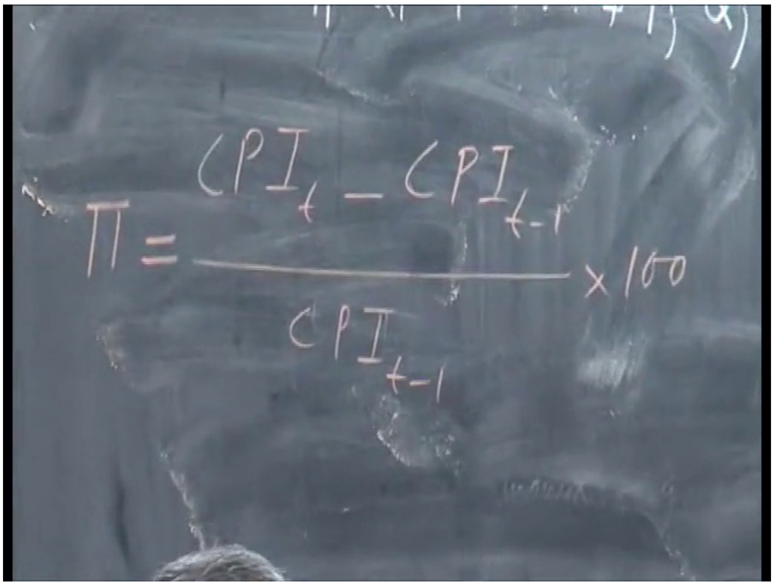

So, pi value which we call pi, it is measured in terms of pi, so the pi value is changing or non zero, it may change, may not change may be constant, but non zero that means CPI is changing continuously. So, you have CPI t minus CPI p minus 1 over CPI t minus 1 in 200 pi is inflation typical notation and economic for inflation is pi Greek alphabet phi typical notation for all output in economic is small typical notation for price is P typical notation for output is y. I have been using them already, but you will get with it, you will get used to that the notation are always this the last point you remember unemployment data define that unemployed total labor force.

I want to make one or two concluding remarks here that if a person is unemployed, he or she cannot be discouraged worker sitting at home nit looking for job. I have friends Kolkata did not get the job in 60s and 70s, I remember who would do nothing will not even look for a job. Those people are not called unemployed, who are not looking for a job or a discouraged worker a person who is unemployed is essentially looking for a job.

Actually, it is fit enough to work offer a job, but he is not finding the work remember secondly part time workers are not counted as unemployed, part time worker are counted as employed, although they have only half the job. There is no waited system in unemployment calculation, if it is part time the one-third, remember that, so the part time workers is not consider to be unemployed is consider to be employed. Although it is not fully employed, the last point I want to mention is a very interesting thing a few point I am going to mention and you can or man view a person is unemployed.

If he is a paid employed like me, I am paid by IIT, I am paid in employee, I am considering to be employed, but all was own business also called employed. I am not paid any anybody, I have my own shop, I am employed, there another very interesting point I have, I get labor laws from vary from country to country. A person is also called employed if he is unpaid family business, he is still employed, suppose your elder brother business even he would not pay you asked to come there you spent time from morning.

You do not get the salary, but you would considered as employed because you are working there and of course if you are temporarily absent because of vacation or ill or something you are not necessary unemployed. You were absent, but you are absent for some reason that does not mean you become the student. So, you do not become unemployed, if you are interest employment and unemployment and labor force is called labor force participation rate is called labor force participation rate. A very interesting labor force participation rate that is if this is the total count of labor force who are above.

The employable age is not a minor child worker the issue of child worker child labor there are not suppose to be working, so they are not part of labor force, but it is the illegal thing to do, child labor is called very important issue in the world. Many countries do not buy form India, they think that Indian carpet industry, Indian handicraft industry employed child worker. They do not want to buy goods from there, but a person who is age who can work of the labor force, but does not mean necessarily that he is either unemployed or employed. This is very much employed, but he is not part of the labor force, so labor force participation something very interesting number is I will tell you example. Suppose, I am an adult human being may be I have the degree like you from a good place.

I can own business, I can get employed, but I decided not be a part of the labor force, I prefer my wife should go out, I sit at the home and do the I raise my stop when I was in college what happened. Basically, this couple decided to reverse the role because I have been got unemployed. The wife started working and the man in the house started looking up the kinds doing the house hold work doing the taking children to bed, putting them to sleep, taking them to the school. All the mom’s work, the man is doing, his name was mister mom, I am not joking, I have seen, I will tell you the you can search internet that the details I am taking about 1980 film early 1980s, you will get the even.

I remember that, the actress, but I forgot the name, so in western country very interesting this is happening which is actual data the labor force participation rate is more or less study that is labor force the actively count or unemployed looking for the job. The labor force participation rate and the male and female amazing trend in the western country like us the male labor force participation is like a man curve going down many men prefer to not work. After few years the female participation ratio has gone up a supply curve and clearly there is the equilibrium like the demand supply diagram.

I thought my goodness what is diagram is then I paid attention to the table, this is greater in man curve open deserve section and find if I am joking or not, they have actually collected numbers labor force participation in the US, in India. It might happen tomorrow, so much freedom from women and equality of women which is very, but you cannot help it. You will find female participation ratio going up more female in the ministry, more female members in the parliament more female in the police force, but no female.

Unfortunately, all male are at home most male are at home in US, the data is showing that go and check that book second chapter. You do not have to go to many later chapter to search for it, so that is also another interesting number of which labor force participation rate has to do with labor has unemployed etcetera.

Then, only calling unemployed anymore clearing the labor force, usually when do people drop out labor force population when they are very young they are not part of labor force. After retirement very old they are not part of the labor force in between say from 70 and 80 year to the 60 years. It should be part of the labor force, but where do you find labor force participation, so what the hell are they doing this is what they are doing wife is very happy earning because they do not earn enough.

That is why you have the women exploitation in labor country one of the reason is that economically not independent. You have to dependent upon the man takes her for the ride. So, women gets freedom economically, then it is much easier than I do not know what else can happen, do not ask me.