

PRESENTER: It's a pleasure to be here to introduce the second Killian lecture. Before I introduce Professor Modigliani, I want to mention briefly the history of the Killian award. It begins with an MIT transfer student who transferred in 1923 from Trinity College, which was later known as Duke University, and graduated with the MIT class of 1926 with an SP in business and engineering administration. This young man, James R. Killian Jr. went on to spend the greater part of his life at MIT, serving as the 10th president of MIT from 1948-1959 and as chairman of the corporation from 1959 to 1971.

Both within MIT in the nation and indeed, throughout the world, he has been a leading advocate of educational innovation and curricular reform. It's lucky we have him around today because we're still innovating in education and considering reform of our curricula. He has worked to strengthen and broaden engineering education and has forcefully advocated support of basic research. You see, he is a man for all seasons, the present one included.

Dr. Killian took a leave from 1957 to 59 to become the first scientific and technical advisor to a president-- President Eisenhower. Dr. Killian was also a leader in establishing public television and public radio and served as chairman of the board of the Corporation for Public Broadcasting in 1973 and 74.

For all these works and many more that I must not take the time to innumerate, Dr. Killian has been honored with at least 39 honorary degrees. It is this man in whose name the Killian award was established by resolution of the MIT faculty in 1971 which reads, "As a permanent tribute to James R. Killian, Jr., 10th president of MIT and chairman of the Corporation for 1959-1971, the faculty of the Institute hereby establishes the James R. Killian Jr. Faculty Achievement Award. The award, which will recognize extraordinary professional complements of members of the faculty, is created as a reflection of Dr. Killian's consistent encouragement and support of professional excellence at the Institute and as a token of affection and esteem for his long and brilliant service to MIT. The resolution needless to say was passed unanimously by the faculty.

Now, let me introduce the 14th Killian award lecturer Professor Franco Modigliani, Institute professor, and professor of economics and finance, and recipient of the Nobel Prize for economics. He will give us the second of two lectures, the overall title of which is, "The Determinants of Individual Thrift and National Wealth." The first lecture was entitled, "The Life Cycle Hypothesis." Today's lecture is entitled, "Application of the Lifestyle Hypothesis to Policy Issues."

Dr. Modigliani has kindly offered to take questions after the lecture. It's an honor to present professor Frankel Modigliani.

[APPLAUSE]

MODIGLIANI: Thank you I hope my voice holds-- it's a little low. In an event, what I have to say would be so fascinating that even if I have no voice, you would understand it anyway.

Now, I will again use the same technique of having before me this table which indicates what I've done, where I am and what I'm going to do. Right now we have done the part which is above the line that we have done part one, two and three. And we aren't quite yet down to the policy issues because, in part, there are some issues in between which have some policy aspect but are still part of the political section and they have to do with the question of allowing a relaxation of some very rigid simplifying assumptions from which we started. We started out with a model in which consumption was perfectly constant of a life, income was constant up to the time and using this model we were able to derive in large number of implications, most of which have been verified-- even though they were not verifiable when the theory was first built-- has since been verified.

However, the world is more complicated and we want to know whether we can either, whether we need to change and reach the model by allowing or completely neglect certain additional features of the world. I did discuss a couple of them yesterday, I mean last time. There are two more that I want to discuss.

One of them is the question that in the very simple model, I assume-- just for size-- that the life is divided into two parts, 40 years of labor of work and 10 years of retirement. And from that I derive various implications like the fact that the wealth income ratio is something like five and so on.

Now the question arises, obviously, that is a very oversimplified picture of the world. What if we allow for the possibility, not only that the numbers may not be 40 and 10, but for the possibility that the length of life-- the length of work and the timing may depend on other variables and maybe a fallacy of function of policy and that would explain both points.

First, mechanically, there is absolutely no difficulty in making the life-- the working life in the entire life any number you want-- if you remember the picture which I have put before you, which is this picture, changing the length of the time. And for instance, suppose we make the time longer, that means that this point instead of being here, will be to the left of it.

And you can really work out that the consequence of that is that this line would be steeper, will get higher-- it will get higher because you will need more resources to take care of the longer retirement. And as a result, also, the overall interval under this area-- the overall amount of wealth in society-- will turn out to be larger. So the shorter the working life, the longer the retirement period, then the higher will be the wealth income ratio, but the wealth income ratio is proportional to saving rate given the rate of growth.

So, you find that society for giving growth-- society where the working life is shorter-- might save more. Now, this per se has one important implication. I said in the simple life cycle model, the saving rate is totally independent of the income of the country.

Here is the channel through which the income could come back-- sneak back, the back way-- because it is conceivable that the richer country-- a country with a higher per capita income-- may want to enjoy that income, in part, by working less and having more leisure. That is one way in which you can exploit the larger per capita income.

In that case, a richer society might tend to have a larger wealth income ratio, hence save a little more. However, this conclusion is not at all obvious because the fact that your productivity is higher works in the opposite direction. If you consider a man who is very unproductive, he may as well retire because working a year more would not give him much, but consider a doctor or a lawyer whose productivity gets very high as they get older or consider a very rich country in which people are very productive, then it cost more to give up a year of retirement. And therefore you may want to postpone retirement, something which we know very well to be the case for people who are exceedingly talented. They tend to retire very late. So that would go the other way.

So, at the moment we know that there is, from empirical data, is a slight tendency for the income effect to prevail. That is, by and large, richer countries do tend to retire a little later. A little earlier. But, this effect is so small that when you try to find its effect on the world on the saving rate, it cannot be found. The saving of it is not, as far as we know, dependent in any way on income.

Now, a second aspect-- a second issue to be considered-- is that of the so-called question of myopia. Let me explain what that is.

The lifecycle model presumes-- is built on the notion of a very rational being that sits down and maps his life strategy, in principle, he does at the beginning of his life. But then as information changes he has to do it again and again, but sits down and works out the smooth consumption and works to achieve this goal. In particular he knows exactly how much he will need when he is old and he starts since his birth, so to speak, he starts planning.

Now of course any interpretation of the life cycle will tell you that the way to look at it is first of all that I don't expect to find that kind of planning until the person is settled. Certainly not a bird, not at 20, maybe at 25, maybe at 30, when a person is finally able to assess what he may expect to earn over his lifetime-- when he finally understands where he belongs-- to the high class, to the middle class, to the low class-- then, you can expect to have this planning.

But it has been suggested that human beings, after all, cannot be that rational, and in particular that is myopia. That is, that when you look at the future needs, the very near future needs loom much bigger than the future one and that a person tends to starve himself when he's old. Well I've never believed that because I've seen many people who may be oblivious to many things and even irrational but are conscious-- very much conscious-- of the needs of when they're old. In any event, the evidence is strikingly in favor of no myopia.

I mean the following thing. Look at the peak wealth that people have when they retire. We have information that. We know that when people retire roughly the amount of wealth they have is five to six times the average income of the community at that time. OK, so if you look at this group, they have about-- this peak group-- which isn't in the age group-- roughly around 65-- they have five times income.

How does that compare with what the model says? Well if you take the simplest model you would find that the number of years of the life, the number of years of consumption in your wealth, should be 10 because there is 10 years of retirement. And that works out to be, essentially a ratio therefore, of 10 of wealth to permanent income because permanent income is the same thing as consumption in this model. So it's 10 times permanent income.

Now, in the reality we observe a number which is smaller than that, a number which is in the order of around six or seven. But this comparison is unfair because the relevant model is one model which allows for family size. In the family size model, the simplified mobile tells you that you take the total number of people during their lifetime-- which is the number of the parents-- two parents-- and the number of children-- times the number of years they are present and that gives you the needs. And you divide the resources over that and the expenditure at any point is given by that per capita expenditure times the number of people present. So the expenditure is highest when there are four people present, saying two parents and two children.

But, the parents themselves are poorer because they divide their wealth-- their income-- with their children, therefore, when they retire they have a small amount of wealth relative to consumption. Already had observed that, this we observe very clearly. People with children that die with less wealth and when you allow for that, the average amount of wealth you would expect to find is about six and a half.

And that is very close to the observations which are in the order of six to seven or seven, perhaps within six and a half or seven and a half.

So, there is no evidence of myopia, unless we want to say that one quarter of the people is very myopic and the other people are exaggerated perhaps. But from my point of view, I'm interested in the aggregation. In the aggregate, I make no violation in assuming that the representative person is behaving rationally. Now, there is another thing which has to do with the liquidity constraint.

The model assumes that having planned his consumption optimally the person is able to do it. That may not be the case if for instance he starts relatively poor and expects to be rich. So he starts with 10, expects to get a hundred, so he wants to consume 20 throughout. Well, in the beginning, he's got only 10 and he wants to consume 20 and that faces him with the problem of constraint.

This is of course something that you students are very familiar with because you are spending much more on your income as long as you are studying and during your graduate studies and so on. Nowadays there are good borrowing facilities but traditionally there have not been and in the most countries there have not been. That means that the consumption part instead of being perfectly smooth, may actually creep up until the constraint disappears and then becomes smooth.

Clearly there is a phase where the constraint doesn't matter. This is not too serious a problem. It doesn't affect the thing very much, it will tend to make for the somewhat larger wealth income ratio because it means postponing consumption and what postpones consumption makes for more wealth.

But, there is no real problem and there is no evidence that this is very serious. But, it will play a role when we talk about policy implications as you will see in a moment.

Now, what comes next is by far the more serious problem and that is the problem that we have neglected so far-- the fact that in the world there may or in fact, they are bequests. That problem has been neglected.

Now, it is very important to try to understand to what extent bequests are important in affecting wealth, particularly because you must remember that, as I told you, that before the life cycle came into being, it used to be believed that all wealth was due to inheritance.

That's the only source of wealth-- was that people were given bequests. Then, the life cycle said, in this simple version said, on the contrary, all the wealth can be explained without a penny ever being bequeathed. So the question is, in reality, how important are bequests?

Now the first proposition is that bequest are affect. Now they are affect not only because you and I know people that have received bequest, but because there's a lot of evidence suggesting that there is a fair amount of bequest. And there are two main sources of information. One source of information is the information that pertains to the way in which wealth changes with age. What's the problem? Oh, I see, I should take the paper out. This thing is smart. If you don't take the paper off it doesn't show. OK. Not dumb like me. OK. Here, what do you have here is a graph that shows the height of these bars is the amount of wealth-- the average amount of wealth held by all people in their respective age groups. So this bar shows that people-- don't take only the top part. Forget about the bottom, the negative part-- let's say, this one says, that people in the age bracket 26 to 35 have one watt-- 1 times income-- so that wealth is 1 times income. But once you get to the age 65-- the peak-- the wealth is roughly five times income.

Now this come out of survey in which you ask people how much wealth you have. They are elaborate things which try to be fairly reliable. This happens to be an average of three different surveys-- because each of them has a certain amount of noise-- you average them. They all agree that the peak is around here, but you average them and you get this out of the picture.

Now what's impressive here is when you compare this picture with this picture. Look at the side. After retirement, you go down conceptually to zero. But, when you look at this picture here, you find that the decommutation is very slow and the last information we have, which is the age of 85 and over, these are people still alive but it's very likely that they could-- between now and then-- eat it all, so clearly they must be leaving most of this, must be left as a bequest.

Another way to look at it is that we have so-called bequests statistics or probate statistics. When people die there is a special procedure by which their estate is probated through the courts and taxed and so on and so forth. From those that we know, that there is a fair amount, a fair flow of bequests. Bequest, remember, is a flow because it's the amount left per year, the bequest flow. There is a stock of bequeathed wealth. And in fact, we know then that there are bequest.

The question now is, how important are these bequests in determining wealth? It could be that almost all wealth is determined by the fact that there are bequest or it could be a small part. So the question is how large?

Now the situation is that this is a very much debated issue and I will have to spend a little time to discuss it because it is an issue that even now is very much very hotly debated and contested. What do you essentially want to know is what you want to measure is the importance of bequests in explaining wealth. Now when that you might look at this is to just look at the following and think, suppose you ask every people or person in the country, how much did you receive by bequest at any point in your life and suppose you sum them up, then you have the total amount of inherited wealth. Suppose you divide that debt by total wealth, you have the share of inherited wealth.

Now, there are many ways in which you can try to establish to measure the share of inherited wealth. The oldest measure that we knew of was obtained by asking people and that appeared to give an answer which was very much what I had expected-- roughly 15%-- 15% of wealth is inherited. That initial survey was followed by many other surveys, they have all come up with about the same answer-- there's a great deal of agreement-- around the figure of 15 to 20 percent.

Another method of computing this stock of inherited wealth is to estimate, somehow, the flow of bequest. Then ask yourself how long a gap there is between the time the bequest is passed on, I mean, what gap in age there is between the person who dies-- the bequeather-- and the person who received. And then you multiply, essentially, the length of life by the flow of bequest, and all of you being engineers and you in calculus, you know that the product of this will give you the stock of bequests.

Now there are various adjustments that must be made because if the economy is growing, then the successive, the amount of bequest left this year is more than that left last year, more than that left the year before and you have to make various adjustment for this final thing. There are two ways in which you can estimate the flow of bequests. One is from exactly this data. Suppose you have this information here much more detailed as to age. We know the probability of people dying and we can say in a year, so many die with this amount of wealth, so many with this amount of wealth, so many with this amount of wealth and so on. We sum them up and we get a measure of the flow.

Or, you can turn to bequest statistics and find out how much is left in a year, in how many of these things through the probate in the course of a year. Both methods have been attempted and we have now a very fine studies made by David [? Demenchik. ?] When you look at the probate data you have a very important issue to remember, that the relevant stock of bequests is not the total bequeathed, but that total minus the inter-spouse bequest because, in my model, the husband and wife are the household. Whether one dies the household is still alive and you can not treat as a bequest what is simply the resources now belong just to one person but there not been any transfer.

It is, may have you, a very stupid thing that the system of taxes taxes those inter-spouse of bequest and forces people to do all kinds of imbecilic things like dividing carefully and keeping accounts of who owns what. That's just a complete, useless thing. The law should realize that the household is a household. That is coming slowly, but it has not been accepted yet. That's an implication, by the way, of the model that you can see very clearly this sort of thing.

Well, these adjustments are not easy to make, you have to estimate how much goes to the children, how much goes to outsiders, how much to the wife, but when you do all of that, again what you find is that, roughly, the amount of the share of inherited wealth comes to roughly 20% at most, one fifth. You get a scatter of answers but they are rather narrow-- between 15% or perhaps 14% and 20% and some of the difference are due to conceptual differences. That is, they measure slightly different things like only inheritance passed on to your own children leaving out the outsiders, then you get a small number, but if you take all the bequest left you get that kind of a number.

That is a small number and it very much suggest that bequest and not a very important thing. But, about three or four years ago two of my younger colleagues, one of them was at MIT, Summers and Kotlikoff, have come out with a paper with a startling result in which they showed, in which they claimed, that the share of would bequeathed wealth is at least over 50% and most likely, over 85%. That's been a rather distressing thing for me [LAUGHTER] and I spent about a year softening with that but gradually I've come back and by the time I'm ready to give this lecture, I have solved the problem completely. And I can tell you from now that the final answer is that the importance of the bequest motive is about one eighth, not 85%, but something in the order of 12%.

Now how I get there, I will tell you in a moment, but first of all, it turns out that these figures are obtained in two ways. One, they use the same method of estimating the flow of the quest and then ruling that out. When they use that method and they get 52%, of which about 20% is due to a mathematical error. They have a wrong formula and they know that. If you correct the formula, a certain amount of that goes away. What is the rest? The rest is interesting.

It's a conceptual difference or a definitional difference. When I say, how much bequest have you received, I mean how much did you get? And you might tell me, "I got \$100,000 years ago." What they want to call bequest received is not \$100,000, but \$100,000 capitalized to the present. So if you got, then, 10 years ago and now, you would say \$150,000 or \$200,000.

So they want to include the capitalization as part of bequest which simply means that they have a peculiar definition of income. Because the income of a person does not include all of his interest, he has to separate carefully the interest that he has earned or what he has accumulated and the interest earned by others. That's an absurd thing in principle and there is no justification for that definition.

Once you adjust just for that definitional difference we are down to about the same estimate.

The other estimate of 85% starts with the huge error, this time not the formula, but they forgot, they did not treat properly durable goods. They treat the durable goods as though they were kind of consumption. If you treat them as a capital goods as they should be it turns out we get a lot of difference why because the young are the people who are most accumulator of durables. So you make an error in the beginning which is then carried on and it's quite easy to make a huge error through that way. And that was about 30%.

And then you make this correction for the definition of bequest to include interest and so on, and you come down to something which is maybe 30%. But there still are, instead of my 20, but there still are some important conceptual differences which explain the difference, in particular, that they define the way they are doing it. They define their household. No, they do not proceed by household, but proceed by individuals and call anybody was over 18-- they call a separate person-- even though he's home eating his father's meals. They treat him as though he had an income of zero. But, he was consuming his father's meals. So he started out with a big deficit. They start out their people with a huge hole which they then have to fill up and that's how they get this very low. I think this explains the remaining difference.

However, they have a comeback and say well, there is at least one difference which is conceptual like this question of how you treat capitalization of bequests. And they suggest that one should not quarrel about definition. Definition should make no difference. You should get the same answer no matter how you define things. And so they suggest an operational definition.

Which is, let's call the importance of bequest as the elasticity-- I'll explain the word in a moment-- as the percent of change in wealth that would occur if the flow of bequest changed 1%. OK? You understand the idea?

Suppose that, somehow, there is a law, that is a taxation, something that makes the flow bequest come down. By what percentage would wealth decline? That's a very fine, a very fine conception. And it turns out that when they use their measure, see, you can readily show that this concept is independent of how you capitalize things because it's a DWDT times T over W , and if you change the measure of T you change T over W and you change the DWDT by exactly the same amount, so that's independence and invariant.

It turns out that when they apply, they calculate-- in terms of their own law and making certain assumptions about preferences-- when they calculate the importance it turns out that importance is 70% of their share. But, since my share is about 60%-- 65 percent of theirs-- it turns out that their measure is just about equal to my share. See? Get this. They use a big share, but then it's got to be multiplied by 0.7 and once you do that it comes out to be essentially my share. So essentially, again, it's something like 20% that is the valid-- 0.3×0.7 is about 0.2.

Now, the next question, however, is this. How can one really reconcile the fact that the share of wealth is only 25%-- how can that be reconciled with the fact that this think is coming down so slowly? How is it possible?

It just seems there must be something wrong because this suggests that most of the wealth is bequeathed. Okay, you hardly consume. You get to a peak wealth and you hardly consume it-- you just pass it on. Okay. Well, it turns out that it is very easy to reconcile the 25% with that figure and this the reinvention of what I have discovered in the last, during the two lectures very clearly because for the following reason.

That they ratio of bequeathed wealth to total wealth has very little to do with what happens from here on. In other words, you're thinking that that's all the wealth that's transferred. And that's most of what I have, but that's wrong. What I have these all this. In other words, suppose that I fixed the wealth from here on. Suppose I fix this part and it's very slow. I can still have any path I want from here to there, provided that since this is the peak, it can not exceed the peak. But it can be like this, or it could be like this and so on. Now, what I have done is to work out the path of wealth of a rational men who smooths consumption, but he knows that he was going to get a bequest of 100, and that on the average he must leave a bequest of 150 because the growth of the economy in the 25 years interval is 50.

That's a the mathematical problem. Work out the optimal path of wealth which you need, or rather, the difference between the amount of wealth you need when you have received a certain bequest and your pass it on later and what you would do without any wealth. And that the optimal path of wealth is shown here by this line. Okay?

This is the optimal path of accumulation. This height of course, is the height that which you die and that's what you leave, so that's what you're aiming for. You notice that to begin with, this is negative. That is, the presence of bequest, initially, makes for less wealth. Why?

Because you get your bequest somewhere around here. Okay. Before you get your bequest-- I'm sorry somewhere around here actually-- before you get your bequest, you are made richer by the fact that you got a larger bequest provided, the rate of interest exceeds that of growth, what you gain on the average, a positive income effect. Therefore you consume more everywhere, beginning in the very beginning when you have no wealth. Therefore, you have to deceive. To carry out that path you turn out that you have a negative-- you have actually a deduction-- you hold less wealth, I shouldn't say deceived, but you hold less wealth than you would otherwise.

Okay. Now, if you compute the area of this bequeaths related wealth and you related to this whole area-- the area underneath this bars-- you find the ratio is just about one to four. So, we have now established, in many different ways, the fact that there is nothing unreasonable. There is a lot of life cycle wealth and if you want to see the life cycle wealth to take a quick look at this graph.

The difference between total wealth and bequeathed wealth is lifecycle wealth. And the lifecycle wealth behaves exactly the way, very much in the way of this graph. Again, let's look, compare the graphs.

This is the way life cycle should behave-- this is the way it does behave. Okay. It rises and then declines and of course, by construction, it ends at zero, because by construction I have made the wealth equal to the bequest. So you see, there is a lot of lifecycle wealth-- much larger than the bequest wealth.

So the conclusion from all this is that we can see that if all wealth were due to the bequest motive, then its importance might be something like one quarter. But, not all wealth is due to the bequest motive. There's another very important source of wealth of inheritance which is the so-called precautionary motive. That is due to the fact that the date at which a person dies is not known. There is a risk of life and unless of a person buys an annuity and thereby edges the risk, that risk is with him and he must end up on the average with some positive amount of wealth to avoid the risk of running out completely.

So you can work out what that kind of implication is. It has been shown that if people were risk adverse, as they supposedly are, and if you take some reasonable assumptions about other interest rates and so on and so forth, you might find that a good deal of the bequest which we actually observe being left could be explained by this motive. Now, of course, there is a little puzzle involved in this. I mention annuities and the puzzle is, if people really have no intention to leave bequests, why don't they buy annuities? Because the annuities is the one way in which you end up clean.

Well they say that is a very interesting question and there is a lot of studying of this. Why don't people buy annuities? It is a fact that outside of pension funds annuities are very rare. And it is a fact that we know that at least some of the reasons for that. One important reason is that if you would want to buy by a known group, a private annuity, it's going to be very expensive. And why is it very expensive? Because of so-called adverse selection. Because, in the market, those people who buy annuities are those people who expect to live forever. Those who expect to have a short life would never think of buying an annuity.

So the insurance company finds that inside of operation of the distribution of operation it buys or sells to a very selected, unfavorable group, and because it has this problem it has to charge a high price and that the price is so high that most people don't buy the advantages to do that. There may also be another important reason. And that is the fact that the bequest motive and the precautionary motive may not be so neatly detachable. Because you could very well imagine that the person says, "I don't really care very much. On the other hand, it is nice if I can leave something."

So if you buy an annuity there's nothing left whatever. Otherwise, there's a chance that something may spill over and that something maybe worth something for you although you wouldn't start out by deciding to save for that purpose. So it is a little hard to separate. There are indications, however, that bequests are-- bequest motive is important only for the very rich. And this comes from two kinds of observations.

There is a famous survey conducted in the 60s in the course of which they asked people, "Why do you save?" And one of the answers was to leave an estate for the family. You know what fraction of the people said that was an important motive? 3%. However, if you classify people by wealth then you find that the wealthier they are, the more frequent this answer is. You get to the top group which was half a million in 1963-- which would be something like three or four millions now-- and you find that 35% say they are saving to leave a bequest.

So, it is that top, only the top part of the distribution that seem to do that. And this is confirmed by a very elegant study done by David [Denmenchik ?] in which they have taken this data coming out of the probate statistics. They know they have information by very ingenious combination of data from the courts, probate data, and data from the income tax in Wisconsin-- which are open to everybody by the Wisconsin law. They were able to construct a life cycle income for these people and their wealth and they find that if you classify people by life cycle wealth up to the 80th percentile, there is no evidence that there is any significant amount of bequest or that those bequest-- those that exist-- tend to change, tend to rise in proportion to the income which is characteristic of the precautionary motive.

But past the 20th percentile, the amount of bequests left rises more than income. It's a nonlinear function and it gets to a pretty high level-- sort of the highest element distribution. Taking all this into account, I would conclude that perhaps half-- I would say that no more than half-- of the flow of bequests-- you must remember that the top 20% is only 20%, but controls more like 40-50% of wealth. So allowing for this, I would say that no more than half of the flow of bequest is due to the bequest motive and therefore that the importance of this is half of 25% or one eighth.

Now that leaves me very satisfied, but I'm waiting for the next attack from my friends, Kotlikoff and Summers, I'm sure they'll find some retort, but that is the way it is now.

Now with this, we can say that, well, we have to say one others thing. There is one eighth of bequests. All right one eighth, one half, I mean, one quarter, one eighth, it's not so important, there exist a certain small amount of bequests. Can we fit those bequests into a life cycle? And the answer is that it is quite easy to fit them into a life cycle. Fitting the life cycle means finding a set of postulates for their behavior such that the basic proposition's one to six, which I gave last time, like the fact that, saving does not depend on income, that saving depends on the rate of growth, that, et cetera, et cetera. Those propositions continue to hold. And that postulate is a very simple one. It is that, bequest left are in nonlinear function not of your wealth but of your relative wealth-- of the position of your wealth relative to the average wealth in society,

The people who leave bequests are not the people who have one million or those who have \$10, but those who have \$10 when everybody else has \$2 and those who have a million when everybody else has two millions. Okay. But, with one million you might be not above the eightieth percentile if everybody else has a lot more.

You can show that if you make this assumption and you add on the assumption that the distribution of relative wealth is stable in time, then you get back all the basic propositions with no problem at all. The only thing is, now, that the wealth income ratio will be affected by the extent of bequest. The more the bequest, the larger will be the wealth income ratio, and therefore, the affect of bequest will tend to raise the saving rate.

Now whether or not bequests are different in different countries is, at the moment, completely unknown. There's only one information outside the United States and that's England, and it turns out in the case of England, their share of bequest is just about 20 percent or just about the same as for the United States, but we do not know of any other country. We suspect for instance that Japan may have a larger, a more important proportional bequest from scattered information, but we do not know.

Now, with this, we can regard as closed, the first part. That is, for a moment summarise, we started from a model in which we simply say that the person allocates his consumption optimally over life subject to the budget constraint, which might include the bequest if there are bequest, and we make a simple assumption that preferences for allocation are such that the person prefers a smooth consumption.

It doesn't have to be constant, it could be arising at the constant rate, but it has to be smooth. From this proposition follows all the proposition that I have derived, both about individual behavior, the importance of transitory income and so on and so forth, and follows the propositions about aggregates.

So I will be inclined to leave this topic here at this point and move on to discuss some of the policy implications of the model.

That is, we now move. We have covered all these and we move to here,

There are quite a number of implications and in half an hour it would be foolish, or less, it would be foolish to try to cover them all but let me give you some sample of the kinds of things that you can do, that you learn out of the life cycle. One important thing that has been learned concerns the mechanism by which monetary policy affects the economy the traditional mechanism was that monetary policy affects interest rates, interest rates affect investment and investment, which is a component of demand affects aggregate output. What the lifecycle model tells you there is more than that because consumption is also affected directly by monetary policy because consumption depends on wealth as property of the lifecycle model, and wealth depends on the behavior of interest rates as you well know,

If interest rates rise everything which has a fixed income will decline in value, beginning with land. Land has a certain rent. The value of land declines if you have a high interest rate. The value of stock declines, the value of long term bonds-- everything declines. And through this process, you have a very fast effect on consumption. And there is indications that this effect is quantitatively fairly important and much faster than the effect by [INAUDIBLE] of investment because the investment effect works, really, quite slowly.

A second illustration which is interesting is the illustration of what can you say about the choice of taxes under the following condition. We know that if we want to reduce aggregate demand, let's say if we want to increase aggregate demand, one thing we can do is to reduce taxes. That's well established and there is plenty of evidence that this happens.

I think only Reagan was foolish enough to think that by reducing taxes you could decrease consumption. He really believed that. That's the whole basis of the Laffer curve, is that conviction. But everybody else knows that higher taxes-- that lower taxes will make for higher consumption.

Now you frequently have a situation in which you know the economy is temporarily depressed, but you think that given some time it will revive and you like to do something over that short run. That was the situation that faced, in particular, Kennedy during his presidency when the economy was quite depressed in the early 60s when he wanted to give it a shock. In that case, what was needed was a permanent shock and so he cut taxes. But Carter in 1977, faced a situation where he wanted to give a temporary shock to the economy, and so he said, well instead of having a permanent tax, we'll have a transitory tax. And by the way, Johnson before that had a temporary increase in taxes in 69 and 70 to finance the Vietnam War.

And they felt that taxes must be taxes. Whenever you reduce-- if the person has to pay \$100 less you consume more. The lifecycle model tells you, "no, sir." What concerns consumption is long time resources. If you cut taxes forever, then of course you will change the resources appreciably, but if you cut taxes one year and you say in advance that it is just one year, then that affects your resources very little and you would expect that you would not find it worthwhile to consume more because you would not be able to maintain the higher consumption. Okay. So what you would do is you would save most of that.

And conversely when Johnson raised his taxes, most of it was actually be saved. People kept their consumption because it wasn't worthwhile to change house just for a year. Okay? To put it in extreme form. And as a result, we have found that the Johnson tax was very ineffective. It had amazingly little effect to everybody's surprise and incidentally it is partly that phenomenon which is the beginning of our great inflation. Because in 1969, the Federal Reserve had an expansionary policy on the ground that these new taxes were going to reduce consumption. Instead they didn't and you had the stimulus of high investment and high consumption coming at the same time.

Now, we have very clear evidence about this. I have just completed a paper with my associate, [? Aldi ?] [? Sterling ?] who's supposed to be here. I don't see him. [? Aldi ?] [? Sterling, ?] raise your hand. [? Aldi ?] [? Sterling, ?] there is [? Aldi ?] [? Sterling. ?] In which we have shown that the taxes are really quite powerful-- contrary to something I will discuss later-- quite powerful in reducing consumption, but not transitory taxes. They don't affect things very much.

One other proposition that I have listed here-- more than [INAUDIBLE] in the transitory income taxes is the consumption taxes. You probably have heard about this, that there are different ways you can tax people. You could tax their wealth. You could tax their income. You could tax their consumption. Now, in general, what the life cycle tells you is that there are great advantages to the taxing of consumption. If you have a progressive tax, because consumption smoothing income tends to be stable for life. Okay.

Now when you have a progressive tax, what you want to avoid is the unfairness that if a guy, in one year, has a million and the rest of the time, starves, he should pay, in that year, \$990,000 of taxes and then the rest of the time starve. What you'd like to do is to tax him on the basis of the average, of his average income. If you tax him on consumption, you tax him on average income. That has very considerable attraction.

There are other attractions to taxing consumption, namely, it encourages saving, something that no IRA or other such nonsense or Keogh plan does because those do not affect in any way-- give no incentive to saving. But taxing consumption would be an incentive to saving. If any of these-- I throw out these challenges and if any of you-- later on-- want to defend President Reagan, I'll be very glad to engage in discussion. Because the IRA is not Reagan, it's really earlier and the Keogh, but they generalized, they improved, they increase their advantages and they created, I believe, this K1 plan, which is a particularly shame and really completely a shame. It's a way of permitting rich people to dodge taxes if nothing else.

I would be glad to take up such issues. There are, of course, problem-- let me just mention some problems there are-- there is a difficulty in mechanically taxing consumption. It's not easy because while income you can still readily establish from the employer, consumption you cannot. And so the only way to establish consumption in a satisfactory way is to take income and then the change in assets. But, that means you need a complete asset accounting at market value and what not and with all the acquisition in between. And that turns out to be a rather complicated take.

There are other indirect ways of taxing consumption and even having progressivity, but they would involve value added tax or something like that. You could do certain things with that.

The next thing that I want to discuss-- oh, yeah, I'm sorry, I do want to say one of the thing. There is one other interesting aspect to consumption tax that follows from the life cycle if the lifecycle is true. And that is, that by and large, young people and old people will be paying more than they are now and middle aged people would be paying less. Why? Because since consumption's smooth, you'll find that in the beginning of life consumption is above-- is higher relative to income and it is low-- if the same thing is true-- after the diamond. That creates some problems. Why? Because young people may then have a liquidity constraint. They may be unable to carry out their plan. I suggest you could take care of that by saying to young people, "Your liability is there, but if you cannot afford to pay it now, you can postpone it and it will accumulate. But you can pay it when you get to the middle age."

The government can simply afford to give them credit, so we could take care of the problem and then you have simply the advantage of a nice way-- fair way of taxation.

Now the government already gives you a lot of credit-- it could give you one more.

The last topic is a topic which would require about three additional lectures. That is the question of the national deficit. It's a big issue because we have been living in this country now for the last two years or three, talking about almost nothing else-- sometimes in very excited and [INAUDIBLE] way, sometimes saying in a soothing way that's not so bad-- but all this talking about that.

What does the problem involve? Fundamentally the problem involved is the following. Suppose that the government buys things or makes transfers. So it spends money. And suppose that when it does that it raises taxes. Then we all know who is paying for the expenditure. You paying the taxes, you are paying for the expenditure. Okay.

But suppose instead it does not raise taxes but just does it out of deficit financing and simply prints bonds which it sells to the public to finance that. Who in heaven pays for that?

Okay. Now, the life cycle model tells you very clearly that who pays for that is not the people who are currently living, but future generations. Now you have first to notice that this issue is a very old issue and there have been lots and lots of discussions beginning from the 16th century as to what happens with respect to the deficit. That all this view that the common people take is the one I've just announced, namely, that by and large it is paid-- if you have a deficit financing-- it falls on to later generations.

But sophisticated economists have repeatedly challenged that view. During the 17th century, in particular-- during the 18th century, in particular-- it was very fashionable to have an argument that said, "not at all. Don't be silly. It is not possible that if we are consuming something now, it is not possible that it would be paid by the people because there is no way we can eat the wheat that hasn't yet been planted. We can only eat our own wheat So the wheat is all there and that's it."

Or they would say that the national that is a debt which is owed by one hand to the other which in no way weakens the body. After all, what happens with the national debt? It's true that interest has to be paid, but the interest is labeled by taxes on some people and it's paid to other people.

So all the interest does is a transfer and that's all. So it cannot-- there is in no way in which future generations can be affected.

Just let me explain why this life cycle-- and I should indicate that the lifecycle is not the only model that concludes the way I said before, but it's a new it's a useful way of looking at the problem.

The life cycle tells you that it is paid, that this argument is fallacious, that indeed, there is falls on future generations.

The basic argument is the following that the life cycle tells you that wealth is held by people for lifecycle reasons. There is a certain amount of wealth, a certain-- five times income is the wealth that's held. Okay. Or four times, whatever it is, five times. That ratio in the numerator includes everything of value that the person has including the government debt.

So the amount of wealth that people want to hold is in no way affected by whether the government runs a deficit or not. Whether there is a debt or not, I still have five times income. But, if wealth is five times income and let's say, twice income is deficit-- if the deficit represents twice income-- then out of that five times income only three times income is known deficit, only three times income is capital, and the other two times income is lost capital. That is, the government reduces the wealth of future generations because it reduces the stock of capital available to them.

And with this approach you can see very well the fallacy of saying we cannot eat the wheat of future generations. Yes we can, because we can eat the tractors in which they would be able to produce more wheat. In that way, we can eat their wheat. So essentially, it's by way of the stock of capital which is transferred. And the interesting thing is that if you look at these things that way you can ask, "what is the annual burden of the debt?" Well it's true it's the amount of capital displaced times the return to the capital. But that return is the interest rate. So to a good approximation the burden of debt is precisely the debt service.

Now, this fundamental proposition has to be qualified. You have to be very careful when using it because you must distinguish between expenditure on current goods and on capital goods. To the extent that the government is borrowing to build capital or to lend to people who produce capital, futures the nations are unaffected because they will pay for that, but they also will receive the benefit. That will be short circuited and there will be no effect.

You have to be very careful. For instance, the interest on the debt is a good measure only if the market interest rate measures that much of material capital. In most system, it doesn't because there are taxes which form a wedge. So the margin for material capital is, in fact, larger than the interest rate. And so the real burden on society is greater because society loses not only the capital but also a certain tax revenue at the same time, if you like to put it that way.

This point of view-- this way of looking at things-- which of course could be enriched considerably, has been challenged very recently at the time which the party at the time, in which the administration has much enjoyed this challenge, there is a new wave of people that say, "No, the deficit, even though the expenditure is deficit financed, it is always paid by the current generation.

This is associated with the name of [? Barrow, ?] a former student of mine, who is all wrong, even though he is very intelligent. How does [? Barrow ?] go about this argument? Well I think it's easy to understand if you go about it in two steps.

First, let us suppose that we accept-- let us suppose a la Milton Friedman, that life is infinitely long. In that case, that proposition is right because suppose at certain point the government gives you \$1,000. Okay.

But it tells you that from now on you're going to pay \$550 of interest in order to service that debt. The present value of the \$50, whatever, is exactly equal to what you get. So if you are smart you're not going to consume a penny more. You're going to take that bond-- buy the bond-- with the money you receive you buy the bond, you keep it there and every year you clip it as you have to pay your \$5. So in this case, it's absolutely true that even though an expenditure maybe deficit finance, nonetheless, it will be borne by the current generation and the reason is very clear why. There is only one generation. After all, the life is infinite, so there is no generation.

So this one, will bear the full brunt. That doesn't seem very promising because we know that life is not infinite. And you know, that this is not a good way. And by the way, the life cycle model would say that there is a certain small effect on the current generation, namely to the extent that, of the present value of the taxes, they will pay all the rest of their life.

Since most wealth is held by old people as you know, that is not much. There is a little bit of that and also will be less taxes. There isn't much to that, but that little effect does exist. If it's infinite then the little effect becomes all.

But [? Barrow ?] knows that life is not infinite and then comes a very ingenious piece. Even if life is finite it can be made given it by virtue of a chain of inheritance. Suppose that the people now living care for the heirs in the sense that they plan to leave them just the right amount of wealth in order to maximize their satisfaction as yours. Okay. In doing so, take care of the fact that the next generation will want to do the same with the next generation, and they with the next generation. In that way you have established a link with now and all future generations and you are back in the model in which you have prepared your life.

In fact, you have allocated optimally between yourself and your heir. Now the government gives you \$1,000 and then we'll tax the next generation. Well, you don't want to change the distribution of resources, therefore, you buy the bonds and you give it as an inheritance to the next generation and he will clip the coupons. So it's very clear that if there were such a chain then he would be right. Now what's the evidence on that? The evidence on that is already covered.

There is evidence that the bequest motive is most unimportant. Even if it were important, even when important, we do not know that it has this particular form. In fact, in my model, the form it takes is that I leave a bequest not because I take into account the utility of the heir, but because it gives me utility to leave a bequest-- which is a very different thing-- and whether or not he is he pays taxes makes no difference to me.

Now, there are, of course, exceptions to this. If a person, if my heir is blind or something, I'm able to leave him more. But it's very questionable that I would go on to compensate anything the government does beyond a sort of basic adjustment.

So what transpires from that is that one has no reason to accept this proposition is fundamentally, it must be the case that when taxes are raised, I'm sorry, when expenditure is raised and taxes are not raised and the deficit is raised, then consumption will not decline except to a small extent.

So you can test this hypothesis by looking at what happens to consumption as a function of taxes and expenditure. We have done that with [? Aldi ?] and we have found that for the United States there is absolutely no evidence that consumption depends on expenditure, taxes given, and there is all the evidence that consumption depends on taxes, expenditure given.

It's very clear that they, empirically-- the Barrow model, which in principle could have some validity-- has no empirical validity. Now all this, as you can see, involves an application of the lifecycle made it easier to understand through the life cycle. By the way, I should clear up one other argument.

People who said there was no effect, you remember, said that the interest payments were transferred from one hand to another. Why are they wrong? Because if I use the saving to cover the deficit then indeed, I have to tax you in order to pay him. But if I did not use the saving to cover the deficit then those savings would create capital and the capital would produce the income which pays the left hand. Okay.

So in effect, it is not a transfer. It appears to be a transfer but there is a loss of resources. In other words, it is a transfer precisely because it was deficit financing. It would not be a transfer otherwise, it would just be in addition to the wealth.

Now I believe that the time is coming to wind up. Perhaps you can see why I have been fascinated by the life cycle. It is a rich model. It has one interesting advantage that it gives you sharp answers to questions.

You say, what's the effect of this and that? And there is an answer. You may be right or wrong. But at least there is no wishy-washy. There's no saying everything is possible. It either is so or it isn't.

So far I would say that he has given correct answers to all the issues. There is only one issue where I'm having a little trouble and I haven't started yet carefully. And that is the theory which is insistently coming out of Japan that says that Japan saves a lot, not because it's growing so fast-- which is what I say-- or perhaps not just because it's so fast-- which is what I say-- but also because people are paid in a peculiar way. Namely, they get these famous bonus payments.

And the notion is that if you get paid big chunks every now and then, you're going to save a lot out of the big chunks. Okay, that, of course, is a completely anti-lifecycle view because in the lifecycle model I take into account the fact that every now and then I have a chunk. I got in my life 600 monthly payment plus 40 chunks and that's all.

These chunks may be partly unknown and to this extent there may be some short run effects, they the may impart windfall and if they're windfall you may not want to consume them and so on. In principle, there should be no effect.

There is some evidence supporting this Japanese data. The main evidence, actually, being that if you look at the time series of the saving rate against the proportion of total wages that took the form of bonus payments, there is a fairly large fairly clear association. But that could be spurious-- could be due to many other reasons-- and I certainly am not willing to give up.

Now, it could also be the Japanese behave in a peculiar way. That is, it could be that they are unrepresentative and very often we are told about the special culture of the East and so on. There could be a variety of reasons. I suspect that they are human beings just like me and, in particular, I have always been struck, in Japan, by the fact that the behavior of Japanese is very similar to that of Italians.

If they behave like Italians, the Italians are not totally rational, but they are rational in these very broad sort of decisions. And when they seem to be rational it's because they are cheating taxes or something like that.

So you can see why that this really has been a rich ground.

Perhaps I should conclude here by telling you what I said when I gave a lecture in Britain some years back about the life cycle. It was that, my only regret is that I have but one life cycle to give the life cycle hypothesis.

[APPLAUSE]

PRESENTER: Professor Modigliani has said he will answer questions as he did at lecture one. I hope you will consider addressing them to him. If you have questions you might want to come to the front or maybe this room is small enough so that we'll be able to hear you. Have we questions? We have a question from back there. If you want to stand and ask a question.

AUDIENCE: The deficit is not good because it's being passed on to future generations, but what i ask is, the US economy has been in a boom in the last four years and partly it is because of the high deficit that [INAUDIBLE]. Is it still bad because the economy has been so good?

MODIGLIANI: Well, let me first say, that you first point out that among the qualifications that one has to make is that deficit is bad when you are close to full employment or close to feasible full employment. If you have slack of resources then there is it is not bad because it does not displace an investment. If you have slack you can have more investment and more government consumption and there, debt is good, not bad.

Now see, the worry about the US deficit is mostly that as you look prospectively, we have been at full employment now, practically because full employment is somewhere around six. We are close to full employment for a couple of years. If you look prospectively, the indications weigh out that at full employment, in the future, it was going to run about 4% per year.

But, if you say, has it been bad over the past, I would say yes it has been bad. Why? Because it's still, when we get back to full employment we'll have more of debt. If we have more debt we have less capital. And, if we just wanted to have an expansion, we did not have to have this tight, this enormous, lavish fiscal policy. We could have been done with monetary policy. So there was just no need to burden future generations in order to achieve a goal which could have been achieved otherwise.

PRESENTER: Another question.

AUDIENCE: You said that the problem with deficit financing is a reduction in wealth.

MODIGLIANI: A reduction in physical capital.

AUDIENCE: Right. Now it seems to me though that if you tax instead of on a deficit, you reduce income. and if savings, desired savings, I would say, five times after taxing them we're taxing the loss that we're reducing.

MODIGLIANI: Right. That's absolutely right. That's absolutely right. Again, this is at the level of qualifications. It turns out that. The way to put it is the following. Government expenditure has a certain cost to the future. It reduces net saving no matter how financed. But if it's financed by debt, the need to reduce it is even more. If it's financed by taxes it does not. So there is an effect on taxes but is much less than the deficit.

PRESENTER: Next question

AUDIENCE: Is there a significant difference, economic effect, between the portion of national expenditure that goes for what they call transfer payments and the proportion for that goes for something like military spending? The large cracks, the large [INAUDIBLE].

MODIGLIANI: Well, I mean there are a variety of differences. I mean, one is that for instance, that when you give transfer payments, somebody eats better and is better. When you spend the money on military junk nobody is better off. So that's one concrete evidence. You can see what I think about the military expenditure, especially the great waste that we have in that area. But otherwise, in terms of market effects it really is immaterial.

This century there is a difference in the following sense that the transfer, per say, is not a part of income. So when you use money to buy military goods, or let's say, to buy teacher services or to buy some other thing which is part of national income, then you get a larger result that when you spend it on transfers. The difference being one. Namely, the first dollar spent, the direct expenditure is part of the income in one case-- is not part of income in the other.

But that is the difference. In a sense, if you spend it well it is better to spend on goods and services than on transfers. That depends also on what is needed. It may be that what's needed is transfer so it's a little hard to judge.

PRESENTER: Next question.

AUDIENCE: Professor, you seem to favor consumption tax rather than income tax, and I would like to find out what do you think about consumption tax? what distributional effects it has? Let's say, in particular, in a developing country? Is it a better thing to have a consumption tax rather than an income tax?

MODIGLIANI: Remember that A consumption tax can be as progressive as you want. There is nothing that says that consumption. I'd said there are some technical difficulties but given, aside from that, in principle you can make the tax as progressive as you want. So I see absolutely no reason why there should be any difference between the two outside of the fact that one is unfair and the other is more fair.

See, particularly, if you have a high progressivity then I think it's very bad. What are we doing in this country? Because we realize that it is unfair to tax, temporally, income we have various kinds of provisions which are designed to make you pay on the smooth income. What are those that arise? First of all you have the so-called carry over and carry back of losses. That's not very important, but it's there. But another dominantly, very important device is precisely to Keogh plan and their IRA.

Those are of no good as incentive to saving but they are very good for the purpose of making you put away money now that you're paying 50% percent tax and give it back to you when you're going to be paying 20% tax which is only fair, after all, because if you paid it on the average then he wouldn't be paying 50%.

AUDIENCE: I'm not sure I want to be in the position of defending the Reagan administration, but is it possible that they could have formulated the policy believing that rational people would realize that the tax cut was going to have to be temporary, and therefore, people would not consume a large portion of the tax cut during the years that it actually occurred, and therefore they would stay mostly in [INAUDIBLE].

MODIGLIANI: Now, this is a question of do you call rational person that believes when a tax cut to be permanent when the president's swears that he would rather die than have the tax cut reversed. Now if you call that. [LAUGHTER]

I mean he has said, literally, he has said, that he will do no, I don't even remember what rather than, conceivably be seen raising taxes again. So that was passed as a permanent that think as was conceivable.

AUDIENCE: It did turn out though, that there was a hundred billion dollar tax cut the year afterwards the year that passed after, the original temporal tax cuts were passed. So, it's not all that audacious to think that someone would have foreseen that.

MODIGLIANI: when you talk about the next year, there was another tax cut, you mean?

AUDIENCE: There was a tax increase.

MODIGLIANI: There was a tax increase because they realized that what had been given to business was so ridiculous that they had to do something about it. I think you have to distinguish between the case of Mr. Carter, or Mr. Johnson who say, "Hey, here is a tax cut and it is our policy that next year automatically, this will expire." That's profoundly different from saying that no tax is ever permanent. And so I have to allow for that.

But I have to make the best guess. And the best guess is that the first cut was permanent, and the next rise was permanent and so on. I don't think you can make any case that anybody would think that they were temporary. In any way they behaved as though they were permanent because the consumption went way up.

AUDIENCE: Isn't Gramm-Rudman a sort of non-exclusive path to the deficit problem?

MODIGLIANI: Well, Gramm-Rudman, I think the only way to say it, is the way Mr. Rudman himself said it. Mr. Ruddman has a very fine, has a good sense of humor, and he has said the Gramm-Ruddman bill is a bad thing whose time has come. And that's exactly what it is. It's a terrible thing. But if there is no way that Congress and the president can get together and in an intelligent fashion find the solution to the problem then the only way is to tie your hands and feet, okay, and be thrown into the water.

I mean that's the only way to do it. Now it's essentially a very bad way of doing things. And very bad because it's completely arbitrary because it's really chaos. And you know I mean what happens is that they cut things like the Internal Revenue Service, which should never be cut because God knows that I mean it's already inefficient. And God knows that there is any need to make it more efficient. At the same time they wouldn't cut some military expenditure on more and so on.

So it's a completely stupid way of doing things which is only justified by the fact that they are unable to reach a rational solution. Now in effect we now have no Gramm-Rudman because it's been declared unconstitutional and we don't really know where the thing stands. I think, however, that reason is slowly descending on Congress and they are now talking about things. They are talking about raising taxes.

Now watch out because one of the things they're talking about is sheer stupidity. They want to raise taxes by selling assets. They want what is the revenue by selling assets. Okay that is as though MIT decided that because it has a deficit it's going to finance it by selling a building. Is that going to change with the deficit? I mean, it's ridiculous that they could even think of that. That's pure window dressing.

PRESENTER: I'll take one more question if there is one. Perhaps, all have been answered. Yes. **MODIGLIANI:** Boy there are, look at that. Look how many questions we got.

PRESENTER: [INAUDIBLE] We have one here.

MODIGLIANI: we have one, two, three, four.

PRESENTER: Oh, you want to take them all? All right, I'll take three more, four more questions.

AUDIENCE: I'm curious about the impact of international trade on this kind of analysis. You focused here on just the United States. And it's not only the trade deficit, but there's a much larger set of issues.

MODIGLIANI: Thank you. You bring about, You bring one other very important angle that I have not had time to touch. Namely, the picture I gave you is the picture of a closed economy in which, when there is a deficit, it displaces capital-- it raises interest rate, displaces capital-- and that's the way it harms a future. In an open economy when it begins to raise interest rate to displace capital, instead of displacing capital it may attract foreign investment which will finance capital. In that case the capital will not decrease does that mean that there is any less burden? Of course not.

Because that income on that capital is not ours-- is theirs. And we'll have to pay interest for that capital, what that capital is producing will have to be paid in interest. We'll have to raise taxes and pay that interest. So in effect it makes absolutely no difference whether the deficit is financed domestically or abroad. It used to be thought-- some people thought it was worse if it was domestic, some people thought it was worse if it was international. It is worse when it's international only in one sense that it can create, eventually, problems.

That is, domestic debt could be increased and increased with bad consequences but technically you could do it. Foreign debt, there comes a time when the foreigners are going to say, "hey, hey. You have borrowed enough. I don't believe you are going to ever going repay. No more." Okay. Then you find yourself in a position where suddenly a source of financing is missing and you either got to do something about your deficit or you're interest rate go to the sky.

So in some sense the foreign debt is worse, but at the second level of approximation.

PRESENTER: Question back there.

AUDIENCE: Yes please. If you think that MIT is a rational being for a minute.

MODIGLIANI: Oh, I always think of that as a rational being.

AUDIENCE: Does your lifecycle hypothesis model have any representations for how to deal with our difficulty with the endowment right now?

MODIGLIANI: Well that is really I have a very different area. There is a vast literature of the deals, I think probably you are well aware of it, that deals with the question of what interest are you serving. Are you serving the current generation? Are you serving to future generations? What duties do you have? Do you want each generation to pay for itself? And all those kind of things. And as I understand there is a general philosophy that says the buildings are not depreciated because each generation has to pay for its own building-- something like that.

I mean the depreciation of the building is not included in ordinary expenses.

AUDIENCE: But technically, if nobody has the money.

MODIGLIANI: Well no, but you know, but I mean, I'm trying to make a better principle out of this. [LAUGHTER] The idea being that if you future people will want the university, well they better pay to get the buildings. So I think there's a philosophy there. So it's a very complicated, very complicated question. And the life cycle is a model of individual behavior.

It does not apply to the Catholic church for instance [LAUGHTER] which poses very serious, very interesting questions, which has perpetuity. And they always create their own problem but this is really it's a model of behavior of individuals of households. PRESENTER: Question? AUDIENCE: A question for Modigliani. You have repeatedly referred to the IRA and the Keogh plans as ways to let rich people to dodge taxes.

MODIGLIANI: The IRA is also for poor people. [CHUCKLING]

AUDIENCE: Given the decrease in propensity to save by the recent generations of Americans, you completely discount the ways in which they encourage or force savings.

MODIGLIANI: Yes, that's very good. What I maintain is that IRA and Keogh in no way encourage savings. Why don't they? Because all you have to do is put the money there. Okay, when you put the money there, you deduct it from income and nobody says you must save it. In fact, I put a lot of money in it and I don't save at all. I just take it out of my old assets. I just take an asset, I change it's name. It's now called another fund or maybe even the same fund. Okay. The moment I move the money from one fund, one account to another, I can deduct from my income taxes. How does that affect my saving?

Now the limited case is the K1, because in the case of the K1 people can borrow to make the payment. See if they don't have enough income they can borrow with it and then they can deduct the interest on the borrowing from their income. Okay, that's the limit of effrontery of the [INAUDIBLE].

PRESENTER: That's a tip, I take it, for us. [LAUGHING] We're in the borrowing class. We have several of them, I'm sure.

AUDIENCE: If you were making a national policy about the oil patching out, would you do anything to bail out the oil patch?

MODIGLIANI: To do what now? The oil patch you mean? Texas?

AUDIENCE: The oil patch. The states who are now in trouble because the world--

MODIGLIANI: Yes, I would. Yes, I would. I am a firm believer in using the price mechanism to allocate resources and using the government to do redistribute resources.

Now I feel in the present case, the lower the price of oil the better it is. We all gain, except Texas, so to speak. They ought to be compensated and with there is many ways we could do that, for instance, the simplest way is to have a tax on imported oil. Okay, because that would raise the price they get. Or we could directly pay them a subsidy, so much per gallon, and I feel that we should do that, especially for one reason, when the price of oil went to the sky, we tax them so it's only fair that now we should do the reverse. Okay.

PRESENTER: Well, I think we want to thank you very much Professor Modigliani for a very a very inspiring and interesting pair of lectures. Thank you.