PRINCIPLES OF BEHAVIORAL ECONOMICS

Prof. Sujata Kar

Department of Management Studies
IIT Roorkee

Week 36

Lecture 36

Hello, this is the course on Principles of Behavioral Economics, and this is lecture 36. In the previous lecture or module, we discussed budgets or, under budget, we talked about consumption categories. Then there are two other categories: wealth account and income account. Now, in this module, we are going to introduce or start talking about the wealth account. But the wealth account has huge connections with important theories like

life cycle theories offered by the behavioralists as well as the classical economists. So, we are going to talk about them as well. So, as I mentioned, we are going to discuss wealth accounts. Another way of dealing with self-control problems is to place funds in accounts that are off-limits. In 1988, Shefrin and Thaler proposed that there is a hierarchy of money locations arranged by how tempting it is for a household to spend the money in each.

Starting from the most accessed or tempting to the least accessed accounts are, first of all, current assets category, for example, cash on hand and money market or checking accounts. Then, the current wealth category, which includes a range of liquid asset accounts such as savings accounts, stocks and bonds, mutual funds, etc. Third is home equity, and the fourth one is the future income account. Home equity refers to the fact that you purchase a house, say, by taking loans. Also, you make some prepayment.

So suppose you make a prepayment of 20%, and 80% is mortgaged. Now when you start paying your mortgage, then gradually the portion on which you have ownership increases. So when it is 70%, you have already paid 10% of your mortgage amount, then your home equity is 30%, in the sense you are the owner of 30% of the valuation of your house. So this is referred to as home equity.

Money in the current asset category is routinely spent each period. So this is the most liquid category: current asset. Less tempting to spend is money in the current wealth category,

which is the second one. These funds are typically designed or designated for saving. Next in the hierarchy is home equity.

Even though the advent of home equity loans has made this category of funds somewhat less sacred, most households still aim to pay off their mortgage by the time they retire, and most succeed. So here, what it actually tries to say is that people are allowed to take loans against their home equity and that's why when you start taking loans against your home equities which means you are infringing on that account as well. Earlier, that account was completely sacred in the sense it was not touched but when you start taking loans, then it is actually touched.

And that's why it is no longer as sacred. But most households still aim to pay off their mortgage by the time they retire. Finally, in the last tempting category of funds lies the future income account. Here, the word 'tempting' implies the temptation to access the money in that account. So, of course, the future income account is the least tempting one because this is your expected income.

These funds include money that will be earned later in life and designated retirement savings accounts. The marginal propensity to spend a dollar of wealth in the current income account is nearly 1. So, current income or current assets are nearly 1. Whereas the propensity to spend a dollar of future income wealth is close to zero. So, we have current assets, current wealth, home equity, and future income.

So, starting with one, this is actually zero. These predictions are in sharp contrast to the standard economic theory of saving, which is the life cycle model. The life cycle model says wealth is perfectly fungible. A simplified version of the life cycle model says that suppose a person has a certain remaining lifetime of N years.

N could be 30, 40, or 50. And that the rate of interest is 0. Let W be the person's wealth, equal to the sum of their assets, this year's income, and future expected income over the rest of their life. So it includes current assets, current income, and future income, as well as home equity. Consumption in this period is then equal to W divided by N.

Any change in wealth, denoted by delta W, no matter what form it takes, that is, it is coming as a bonus at work or an increase in the value of one's home, even an inheritance expected in a decade produces the same change in current consumption, namely delta W divided by N. if you think that given all your current assets, income, and future possible income, your

lifetime wealth is, say, 1 crore rupees, and you are thinking about this when you are, say, 30 years old and expect to live for another 50 years,

then one crore divided by 50 is basically suggested to be the consumption in the current period. So each and every period, you are consuming one crore divided by 50. Now, if there is a change in the wealth by Delta W, it can be going up or going down. If you lose your job, then the total wealth would decrease. If you have a promising career, then that may lead to an increase in total wealth.

You get some promotion, you get some increase in your income - sudden increase in your income, then that is perfectly assimilated again divided by N and then assimilated with the total wealth. The alternative proposed behavioral life cycle model suggests that if money can be transferred to the least tempting account, savings would increase. The least tempting account was the future income account, so if you put the money there, then you are basically putting it in an account which is least tempting to access, and as a result, people will not breach it much. If they leave it there, then savings build up.

This insight can be used in designing government programs to stimulate saving. According to the behavioral life cycle model, if households can be persuaded to move some of their funds from the current income account to future income accounts, long-term savings will increase. Households that contribute to retirement savings plans display steady increases in the funds in these accounts with no apparent reduction in the funds in other accounts. That is, they save more. So it is possible that once you are in the habit of saving, then you save other than your retirement also.

So besides your retirement savings, you are also saving in other accounts, and as a result, you are saving more. Now we talk about the life cycle theory in a little more detail. The essence of the life cycle theory is this. In any year, compute the present value of your wealth, including current income, net assets, and future income. Figure out the level of annuity you could purchase with that money.

Then consume the amount you would receive if you, in fact, owned such an annuity. The theory is simple. Elegant and rational qualities are valued by economists. Unfortunately, for all its elegance and rationality, the life cycle model has not tested very well. The anomalous empirical evidence on consumption falls into roughly two categories.

First, consumption appears to be excessively sensitive to income. Over the life cycle, the young and the old appear to consume too little, and the middle-aged consume too much.

Also, year-to-year consumption rates are too highly correlated with income to be consistent with the model. Second, various forms of wealth do not appear to be as close substitutes as the theory suggests. In particular, households appear to have a very low marginal propensity to consume from either pension wealth or home equity compared to other assets.

So, I just quickly mentioned what the marginal propensity to consume is for those who are not initiated. Basically, this is a Keynesian idea where it says that there is an aggregate income of Y. Now, Individuals spend a certain part of this income on consumption. So this actually measures the amount that is spent on consumption or, basically, the ratio which is spent on consumption. Alternatively, one can say that if your income increases by one rupee

or one unit, then how much your consumption is going to change. So the consumption function in the aggregate is written as having an autonomous component C bar and then a component which depends on income. So Y is income? The small c is known as MPC or marginal propensity to consume. So this refers to or this means that if income increases by

say, income increases by one unit, then how much consumption is going to increase or how much consumption is going to change. Broadly, if income changes by one unit, then by what amount or how much consumption is going to respond to it. Now, several potential explanations for the empirical difficulties have been identified. Maybe people aren't rational enough to calculate present values and annuity payments. Then again, maybe people are hyper-rational and altruistic, leading them to calculate not just the present value of their own wealth but also the wealth of their heirs.

Or perhaps credit markets are to blame, with liquidity constraints preventing people from achieving the life cycle plan they would otherwise choose to adopt. So basically, all this we are saying since we have observed that the marginal propensity to consume from the different accounts that the behavioral life cycle model says or hypothesizes are very different. People have a high marginal propensity to consume from current assets and current income categories.

While the marginal propensity to consume is very low for home equity and future income accounts. These and other explanations have all received some support and criticism in the voluminous savings literature. In this module, however, we focus on an assumption of the life cycle model that has not received much attention, but which, if modified, can allow the theory to explain many of the savings anomalies that have been observed. The key assumption is fungibility.

In the context of the life cycle theory, the fungibility assumption is what permits all the components of wealth to be collapsed into a single number, as we have seen that all the accounts are put together and called W. Here, we are violating the assumption of fungibility. According to the life cycle hypothesis, the effect of winning a $300 betting pool should be the same as having a stock in which you own 100 shares that increase by $3 per share, or having the value of your pension increase by $300.

All these situations give you $300, and all of them should be treated in a similar fashion or the same fashion. The marginal propensity to consume for all types of wealth is supposed to be equal, assuming no transaction costs and so on. A simple way of thinking about how people actually behave with respect to various types of wealth is to assume households have a system of mental accounts. One formulation is to consider three broad accounts, which I have already mentioned. One is the current income account; another is an asset account.

We are calling them C, A, and the final one is the future income account. So the home equity account is actually just dropped here. So we have three broad accounts: C current income, A asset account, and F future income. Roughly speaking, the MPC from C is close to unity. The MPC from F is close to 0.

This has already been mentioned. And the MPC from A is somewhere in between. Since the null hypothesis is that all three MPCs are equal, these predictions are quite strong. Along with the system of mental accounts with varying MPCs, two other modifications to the standard lifecycle theory are in order. First, people are impatient.

Especially over the short run, people act as if their discount rate exceeds the interest rate. So this is the discount rate which we apply to future consumption or to the future broadly. It could be you receive some money in the future, you make some consumption in the future, any decisions related to the future. The presence of high short-run discount rates creates the second problem, which is self-control. We are impatient; we are not able to control ourselves.

We want to bring forward future consumption ASAP. Whatever we wanted to do tomorrow, we wanted to bring it forward to today as much as possible. The life cycle theory assumes that individuals solve for the optimal consumption plan and then execute it with a will of steel. In real life, people realize that self-control is difficult, and so they take steps to constrain their future behavior. One method is to take irreversible actions, such as joining a pension plan or buying whole life insurance.

The other method is to adopt internally enforced rules of thumb. Examples of such rules are: Keep two months' income in asset accounts. Do not borrow except to make durable goods purchases, such as a house, car, or major appliance. Note that households following the latter rule might appear to be liquidity-constrained—unable to borrow—whereas they are actually unwilling to borrow.

To summarize, the household being described can be thought of as following these prudent rules. First, live within your means. Do not borrow from F (that is, the future income account) or A (that is, the asset account) to increase current consumption, except during well-defined emergencies, such as spells of unemployment. Even then, cut consumption as much as possible. The implication is that consumption tracks income. So if you try to increase your income, your consumption is going to increase. So try to control your consumption.

Keep a rainy day account equal to some fraction of income. Do not invade this account except in emergencies. The implication is that your current asset or asset account is small. Third, save for retirement in ways that require little self-control. So most retirement savings are non-discretionary.

Such as social security, pensions, whole life insurance, and home equity. Since these are non-discretionary, you most often, due to the problem of self-control, do not end up saving sufficiently for retirement. As a result, we need to exercise self-control in order to save for retirement. These rules are sensible second-best solutions to the retirement savings problems that humans face. A consensus seems to be emerging among economists that consumption is too sensitive to current income to be consistent with the lifetime conception of permanent income.

The evidence in support of this view comes from a wide variety of sources, and the conclusion is the same. Whether one studies so-called low-frequency decisions—that is, the shape of the lifetime consumption profile—or high-frequency decisions. The smoothing of year-to-year consumption. High frequency means you are basically taking or changing your decisions, evaluating them more regularly compared to a low-frequency decision. Where you are making a decision once for a lifetime.

The heart of the life-cycle theory of saving is a hump-shaped age-saving profile. The young, whose incomes are below their permanent income, borrow to finance consumption. The middle-aged save for retirement, while the old dissave. So, as suggested, if I measure

age here and saving here, it shows a hump-shaped curve. So, if I consider a steady income or the lifetime income, say W,

I can have a slightly upward-sloping line. In that case, when age is low, people are young and dissaving. Then, when this is the saving line, they are borrowing and effectively dissaving. In middle age, they are saving, and when they retire, they start dissaving as their income decreases, and as a result, they now use their saved money to continue their consumption.

Numerous authors have studied the shape of consumption profiles over the life cycle and concluded that they resemble income profiles too much to align with both the life cycle and rational expectations unless liquidity constraints are significant. The permanent income savings model predicts that the consumption growth rate in a country depends primarily on the interest rate. Thus, if interest rates worldwide are equalized, long-term consumption growth rates should also converge.

Instead, consumption growth rates are highly correlated with income growth rates. So, as it is suggested that as income or consumption tracks income, as income growth increases, consumption growth also increases. The high correlation of consumption and income growth rates could be consistent with the life cycle model if everyone in an economy had flat income and flat consumption over their lifetimes. Then, in a fast-growing country, the young will be much richer than the old, and when an old person dies and is replaced by a young one who consumes much more, aggregate consumption increases. So, the life cycle theory predicts that the cross-sectional age-consumption profile should be less steeply sloped in a rapidly growing country than in a slowly growing country.

At any point in time, the consumption of the young relative to the consumption of the old should be positively correlated with the growth of GNP. Here, GNP stands for Gross National Product. Instead, it is observed that age-consumption profiles are very similar across countries. Indeed, the profile was steeper in Japan than in the US, even when Japan had much higher growth rates during the 80s.

Again, the answer seems to be that consumption tracks income. Another prediction of the life cycle theory is that the shape of consumption profiles should be independent of the shape of income profiles, holding levels constant. Casual empiricism suggests that this is not true, since most graduate students—even those with high income expectations, such as medical students—consume much less than their permanent income. Hard data gives the

same impression: the age-consumption profile is strongly influenced by the income profile. The result is due in part to liquidity constraints.

So, what we claim is that it is not true that The consumption profile is independent of income profiles. We have repeatedly argued that consumption tracks income. Growth in consumption is highly correlated with growth in income. Similarly, the consumption profile is highly related to income profiles, which is why they cannot be treated as completely independent of each other.

Both the life-cycle theory and the permanent income hypothesis imply that year-to-year variations in income will be smooth, so that consumption is a constant proportion of permanent rather than current income. However, annual consumption appears to be excessively sensitive to current income. Again, this is an assumption that appears invalid because consumption is highly tracked by—or tracks—income with extreme accuracy. We can expect an MPC roughly equal to 1 or very close to 1.

So, when consumption changes, then— when income changes, consumption also changes. This is exactly as mentioned here when we say that consumption appears to be excessively sensitive to current income. One way of estimating the importance of income-sensitive behavior is to consider the possibility that there are two types of consumers. One type satisfies the permanent income hypothesis.

The other type follows the rule of thumb: spend what you make. With this, I conclude this module. We will further continue our discussion on the life cycle or certain aspects and perspectives of life cycle theory, followed by income accounting and other applications of mental accounting. Thank you.