Why Savings is not a Function of the Interest Rate in this Course

1) In developing a richer model of the Consumption Function, we are implicitly developing a richer model of Private Savings, because S = (Y-T) - C. Most people, before they have been neuralized, think that Savings is a positive function of the interest rate. This, of course, means that Consumption must be a negative function of the interest rate. This could easily be true, but the reason that we are ignoring it is because empirically the effect is small.

2) The reason the effect is small is because an increase in interest rates, for example, sets off two effects, and whether consumption falls (savings rises) or consumption rises (savings falls) depends upon the relative strength of these two effects.

The Income Effect: With higher interest rates, savers are, in essence, richer people because any given amount of savings will result in more income in the future. Richer people like to consume more in general - this means that consumption in the present **and** consumption in the future will increase; but if consumption in the present increases, then savings must necessarily **decrease**. While this may seem counterintuitive, consider someone who has a target level of consumption in the future. With higher interest rates, this individual will need to save less to reach his/her target.

The Substitution Effect: With higher interest rates, the opportunity cost of consumption in the future goes down (the amount of present consumption that one has to give up to get future consumption goes down). Alternatively, present consumption becomes more expensive because by consuming now, and not saving, the consumer are giving up more future consumption than he/she did previously. This induces more savings.
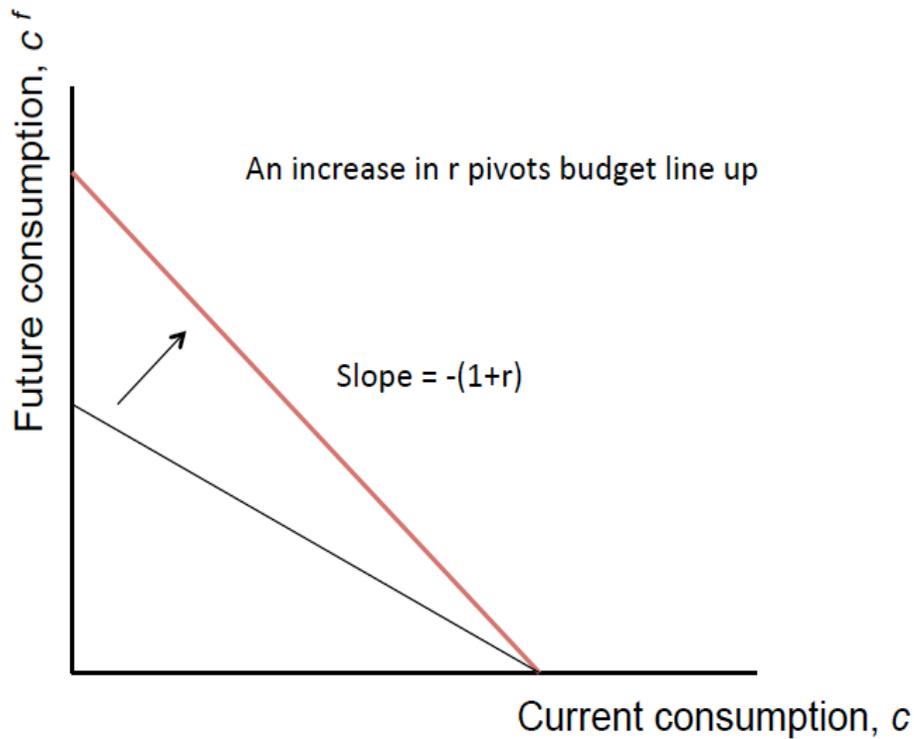
Which of these two effects is stronger depends upon something called the "intertemporal elasticity of substitution in consumption" (say this 3 times fast). This number (which may be different for different consumers) tells you how willing you are to substitute consumption across time periods:

i) Consumers with Low Elasticities of Substitution will **decrease** savings when interest rates rise because they do not want to sacrifice consumption now for more in the future (even if the price of future consumption has gone down). Their income effect is stronger than their substitution effect.
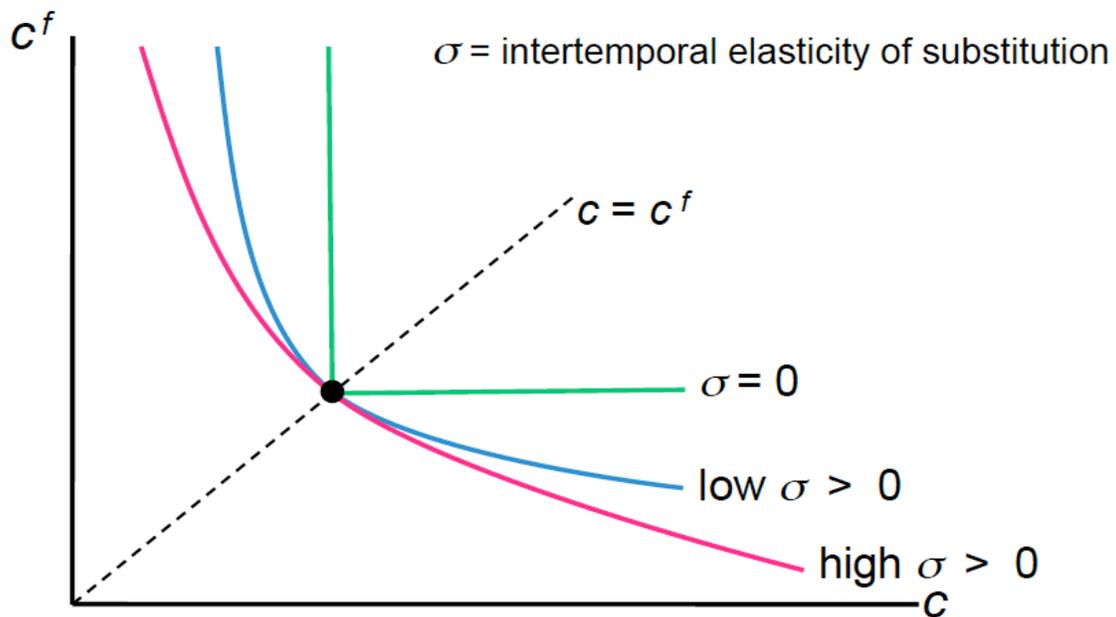
ii) Consumers with Middling Elasticities of Substitution will leave savings **unchanged** when interest rates rise. Their income effect more or less nullifies their substitution effect leaving savings unchanged. They DO consume more in the future, but not because they save more.

iii) Consumers with High Elasticities of Substitution will **increase** savings when interest rates rise because they are more willing to sacrifice consumption now when the price of future consumption goes down. Their substitution effect is stronger than their income effect.

We can look at this formally with indifference curves and budget lines (Ec11 Lives). First, the budget line. The slope of the budget line is $-(1+r)$ and rises as r rises as illustrated below:

Future consumption, c^f

An increase in r pivots budget line up

Slope = $-(1+r)$

Current consumption, c

Now, the indifference curves:

c^f

σ = intertemporal elasticity of substitution

$c = c^f$

$\sigma = 0$

low $\sigma > 0$

high $\sigma > 0$

c

Combining the budget lines and indifference curves:
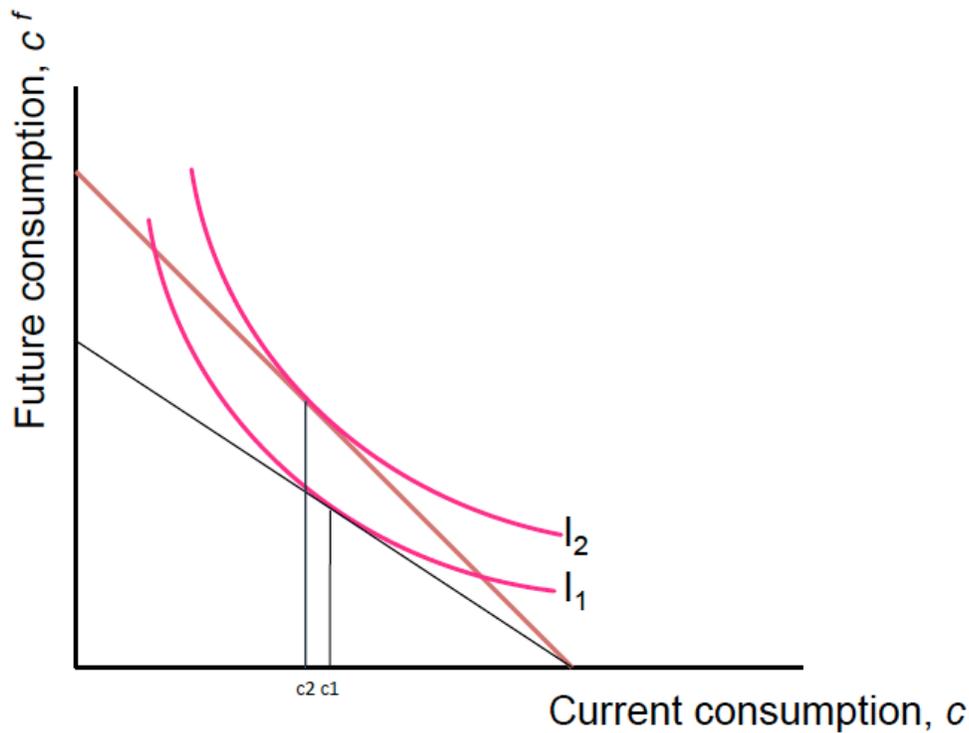
In this case, savings increases (and consumption falls) as the interest rate increases since c2 is to the left of c1. But:

1) The effect is small, and

2) Had the indifference curves been shaped differently (ie. if the elasticity of intertemporal substitution had been less than or equal to 1), savings would not have changed or would have fallen.

Because for the middle range of elasticities, savings does not change (and because there may be equal numbers of consumers in the other two camps), we will assume in this Course that savings is **NOT** a positive function of the interest rate (so consumption in the present is not a negative function of the interest rate).

Original graphs courtesy of Andrew Abel, Wharton School, U. of Penn