1. Suppose Bryan has no current financial wealth but anticipates earning $4500 during
the current period and $6600 during the future. He can borrow or lend at a real
interest rate of 10%.
   a) Is it possible for Ed to spend exactly $6000 in each period? Explain.
   b) Is it possible for Ed to spend exactly $5500 in each period? Explain.
   c) Answer the question in both parts (a) and (b) assuming Ed earns $6500 in the first
      period and $4400 in the future period.

This question deals with the Bryan’s (or Ed’s, I guess) tradeoff over time of current
and future consumption, which we summarized as

\[ \text{Future } C = \text{Future } Y + (Y-C)(1+r). \]

By applying the formula to (a): \[ \text{Future } C = 6600 + (4500-6000)(1.1) = 4950. \] Thus,
if Bryan spends 6000 in the first period, he will have to borrow 1500 and pay back
1650 next year. This will not leave him enough to spend 6000 in the future period.
In (b): \[ \text{Future } C = 6600 + (4500-5500)(1.1) = 5500. \] Therefore, it is possible for
Bryan to spend 5500 in each period.

(a) Future C = 4400 + (6500 – 6000)(1.1) = 4950.
(b) Future C = 4400 + (6500 – 5500)(1.1) = 5500. Answers won’t change.

2. Congratulations, you’ve won $11,000,000 in the lottery. You are given the option of
receiving the entire amount next year, or $10,000,000 this year. You can borrow and
lend at 10%. Which option will you choose? Explain.

All other things the same, you should be indifferent between the options. If you really
want to spend $10,000,000 now, you could receive the winnings now, or borrow
$10,000,000 now and exactly pay back the loan with the winnings received next year.
If you want to spend all in the future, you could receive $10,000,000 now, lend it out
at 10%, and get paid $11,000,000 for future consumption. Of course, by assuming
everything else the same, we ignore complicated real world factors like risk,
differences in borrowing and lending rates, and so on.

3. What does economic theory predict will happen to desired aggregate consumption,
saving and investment (as a proportion of current income) if the following occur? Use
a graph to illustrate your answer.
   a) Improvements in technology increase the expected future profits of new factories.
   b) Stock prices rise dramatically.
   c) The real interest rate rises.
   d) Scientists predict that the earth will be destroyed by a comet in five years.
The intention of this question is to consider the direct effects of the events above on household and firm decisions, without considering the equilibrium effects in the market for loanable funds (granted, the wording of the question is ambiguous).

a) This will likely only affect firms’ investment decision. Since MPR rises, more investment projects will look profitable given the real interest rate, so investment will likely rise (shift to the right). b) While stock prices could affect the real interest rate at which firms borrow, the strongest effect of rising stock prices is on household wealth. Higher stock prices increase household wealth; current consumption would rise and current saving would fall for any given interest rate (C/Y shifts to the right; S/Y shifts to the left). c) An increase in the real interest rate will cause a decrease in the quantity of investment demand, a decrease in the quantity of desired consumption, and an increase in the quantity of desired saving. In each case, the change in the interest rate causes a movement along the curve. d) This will likely alter households’ preferences for current consumption over future consumption. Thus, C will and S will fall. Firms might also believe that MPR will be lower, so the investment demand curve would shift left.

4. Imagine a hypothetical economy that does not trade with other countries and has no government sector. What will be the likely affect of the following on the real interest rate and the share of spending on consumption? Explain your prediction.

a) Because of uncertain times, households increase their saving rate.

b) Firms become pessimistic about future economic activity.

a) An increase in households’ saving rate increases the supply of loanable funds, ceteris paribus, leading to a surplus of funds. Because of the surplus, the real interest rate will fall to a lower equilibrium level and the share of income going to investment will increase. There are two factors affecting consumption – consumption tends to decrease directly because of the increased desire for saving, but it tends to increase as the interest rate falls. However, from the circular flow identity (1 = C/Y + I/Y) and the result that I/Y rises, the former effect must outweigh the latter; i.e. C/Y falls in equilibrium.

b) If firms become pessimistic about the future, their expectations of future profit rates will likely fall. Investment demand will shift left, causing the real interest rate to fall, S/Y to fall and C/Y to rise.

5. According to the circular flow model, in an economy with no government sector and no interaction with the rest of the world, investment must equal saving. Yet, our model of the market for borrowing and lending works by assuming that, if the real interest rate is lower than its “equilibrium” value, there is a shortage of loanable funds; i.e., investment exceeds saving. Explain this paradox.

This was a tough one. The answer depends on the distinction between desired magnitudes and actual magnitudes. The paradox can be explained by noting that the circular flow (with no government and ROW) predicts that actual saving must equal actual investment always, by definition and regardless of what the interest rate is.
shortage of loanable funds implies that, at some real interest rate, desired saving is less than desired investment. But even in this case (when there is a shortage) actual saving and investment are equal. Here is an example to help firm up the idea. Suppose that at an interest rate of 5%, desired saving = $1000 and desired investment = $1500, so that we have a shortage of loanable funds because saving is “too low”. But if saving is “too low”, consumption is “too high.” Now, suppose that actual saving equals desired saving; one way for desired investment to exceed actual saving is that because households are spending more than firms would like, firms’ inventories are falling. That is, actual inventory investment is negative, and lower than what firms desire. Thus, actual investment in this case would be lower than desired investment. Only in equilibrium will desired saving = actual saving = desired investment = actual investment.

6. You want to buy a car that costs $10,000. You have $10,000 in the bank earning 5% interest. You can pay for the car either by using the money in your bank account, or by borrowing the cost of the car from the bank at 5% interest. Use the logic in chapter 11 of Landsburg to explain why you should be indifferent between these two options for financing your automobile purchase.

With each option, you end up with the same thing next year. If you borrow the money to buy the car, you must pay back $10,500 next year. But you will keep your $10,000 in your saving account over the year, which will be worth exactly $10,500 and can be used to pay back the loan. If you don’t borrow, but finance the car by cashing in your saving account, you don’t earn interest over the year, but you don’t have to pay back a loan either. In each case, what you are left with at the end of the year is the same – a car and no cash. It really doesn’t matter how you finance the car.

Of course, in the real world, you usually can’t borrow and lend at the same rate. If you earn 5% at the bank and must pay 7% to borrow, you would be better off paying cash for the car, ceteris paribus.