Problem Set 10 Solutions

1. (a) FALSE. According to Efficient Market Theory, the information about the development of a new drug will be instantaneously incorporated into the company’s stock price.

(b) FALSE. If consumers can freely lend but not borrow, then they may consume no more than $Y_1$ in period one, and no more than $(1 + r) Y_1 + Y_2$ in period two. Therefore, the budget constraint looks like a straight line between the $C_2$-intercept and the endowment point, at which point there is a kink and the budget constraint drops straight down. Therefore, an increase in income in the current period causes the budget constraint to shift out. Thus, if the consumer’s initial optimal consumption bundle is tangent to the budget constraint at or to the left of the endowment point – if the consumer does not want to borrow – current and future consumption will both increase (as in Figure (a)). Notice, however, that if the consumer would like to borrow but is constrained by the borrowing constraint, an increase in current income may lead only to an increase in current consumption, as the consumer may still be constrained by her inability to borrow – see Figure (b).

(c) FALSE. Recall that profit maximizing firms demand capital according to the relationship

\[ r = \frac{MRP_K}{MP_K}. \]

Therefore, if $MP_K$ increases for all levels of $K$, then more capital will be demanded at every possible interest rate $r$. This therefore increases investment at every possible interest rate $r$; that is, the investment demand curve shifts to the right, leading to an increase in the equilibrium interest rate.

(d) FALSE. When consumers are borrowing, an increase in the interest rate affects current consumption in two ways: there is a negative substitution effect and a negative income
effect. Therefore, current consumption decreases, implying that savings increase. How-
however, when consumers are lending, an increase in the interest rate leads to a negative
substitution effect and a positive income effect. Thus, if the income effect dominates
the substitution effect, current consumption may in fact increase, implying that savings
have decreased.

2. A $1000 five-year 5% coupon bond has the following stream of payments:

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment</td>
<td>$50</td>
<td>$50</td>
<td>$50</td>
<td>$50</td>
<td>$1050</td>
</tr>
<tr>
<td>PV ((r = .06))</td>
<td>$50/(1.06)^1</td>
<td>$50/(1.06)^2</td>
<td>$50/(1.06)^3</td>
<td>$50/(1.06)^4</td>
<td>$1050/(1.06)^5</td>
</tr>
</tbody>
</table>

Therefore, one should be willing to pay the net present value:

\[
NPV = \frac{50}{1.06} + \frac{50}{(1.06)^2} + \frac{50}{(1.06)^3} + \frac{50}{(1.06)^4} + \frac{1050}{(1.06)^5} \\
\approx $957.88
\]

3. The data for this question are the closing figures for NKE on the NYSE at 4:00PM on April 17, 2006.

(a) One share of Nike stock is selling for $81.81.
(b) The annual dividend payment for each share of Nike stock is $1.24. Therefore, the
dividend-price ratio is \(\frac{1.24}{81.81} \approx 0.0152\). Since earnings per share for Nike is $5.30, the
price-earnings ratio is \(\frac{81.81}{5.30} \approx 15.436\).

4. The Ethicist’s response:

Time may be money, but how much, really, for an eighth grader, who is not paid to attend
school? And do we really want all our interactions based on the variable-pricing airline-seat
model? Were pizza a necessity of life (as many teenagers regard it) and in short supply,
you would have been been guilty of profiteering, as your counselor charged. But there was
plenty of pizza, so you didn’t exploit anyone. And pizza does remain a luxury, so nobody
was compelled to buy your pricier slices. (Were they? I assume there was no gunplay.) Thus
your actions were not unethical, but they were poor social policy – if that’s not too fancy a
way to describe undermining a pizza party.

Your counselor’s concern was valid, if poorly expressed. The dollar-a-slice deal made possible
a schoolwide pizza party, affordable fun for everyone. Judging by the long line, it’s something
people enjoy.

You turned it into a two-tiered system – kids with money don’t wait; kids without money do
– shifting it from a we’re-all-in-it-together event to something less communitarian (if more
profitable).