

Economics 222: Exercise A Answer Guide

1. (a) Based on the idea of opportunity cost, the logical formula would be

$$p_b(1+i) = 1000,$$

so with $i = 0.04$ this gives a price of \$961.54.

- (b) The expected real interest rate is $r = i - \pi^e = 4 - 2 = 2$ percent.
(c) Using our formula, $p_b = 952.38$, so the bond price falls.

2. (a) For the ratio to grow at 2 percent the numerator must grow at 4 percent if the denominator grows at 2 percent.

- (b) The formula is:

$$0.9(1.02)^n = 1,$$

which gives $n = 5.32$ years.

3. (a) False. Newsprint that is used as an intermediate good does not count as part of GDP. But newsprint that is used as a final good (say to line pet cages) does.

(b) False. A country could have both a low private saving rate and a current account surplus if it had either high government saving (a government budget surplus) or low investment.

(c) False. See box 2.4. The CPI probably overstates increases in the cost of living, because of quality improvements and substitution bias.

4. (a) (b) The table (with added row and column of results) is:

| Year | N | N growth | Y | Y growth | Y/N |
|------|---------|------------|---------|------------|-------|
| 1995 | 12869.9 | | 832472 | | 64.68 |
| 2000 | 14258.2 | 10.78% | 1004935 | 20.72% | 70.48 |
| 2005 | 15695.5 | 10.07% | 1143801 | 13.81% | 72.87 |

[Your numbers may differ slightly, due to data revisions.]

(c) The approximation gives $20.72 - 10.78 = 9.94$ for 1995-2000 and $13.81 - 10.07 = 3.74$ for 2000-2005.

(d) The exact result uses the last column to give: 8.96 and 3.39. (The approximation works better for small growth rates.)

(e) Think of the annual growth rate as an unknown, x , then:

$$(1+x)^5 = 1.10,$$

say, where the growth over 5 years is 10 percent.

5. (a)

$$MPN = K^{0.5}0.5N^{-0.5}.$$

(b)

$$w = K^{0.5}0.5N^{-0.5}.$$

(c) By growth accounting, output growth will be $0.5(3)+0.5(3) = 3$ percent per year.

(d) Now applying the same logic to the real wage, its growth rate will be zero.

6. (a)

$$w = A(100 - 2N).$$

(b) Combining labour demand (from part (a)) with labour supply gives us $N = 48$ and $w = 4$.

(c) When $A = 0.8$ we have $w = 80 - 1.6N$, which with labour supply gives $w = 3.81$ and $N = 47.62$. Both fall as a result of the oil price shock.

(d) If w is sticky at 4 then we can find employment from the labour demand curve:

$$4 = 0.8(100 - 2N),$$

so $N = 47.5$ which represents a larger fall in employment than in part (c).