Economics and Investment Markets - Answers

Reading 1 Q1.1–Q1.4

Sharon Kincaid, a senior manager with High Value Consulting (HVC), has been asked to give a presentation on the fundamental determinants of risk and return for investors in the United Kingdom.

In the first part of her presentation, Kincaid analyzes the determinants of risk premiums and volatility for fixed-income securities that carry default risk. She gives the example of a one-year, zero-coupon bond issued by a corporation based in the United Kingdom and currently trading at GBP 93.56 per 100 par value.

Kincaid notes that the one-year real risk-free rate is currently 1.5% and inflation is expected to be 2.0% over the next year. She estimates that investors require 75 basis points as compensation for inflation uncertainty.

Later in her presentation, Kincaid shares her expectation that, over the next decade, the UK economy will experience average annual economic growth that matches the long-term trend rate. However, she forecasts an increase in the volatility of economic growth.

Question 1.1

The credit premium for the UK corporate bond is *closest* to:

A. 1.88%.

B. 2.63%. ✓

C. 3.38%.

Correct Answer: B

EXPLANATION

The general equation for the discounted value of risky cash flows is:

$$P_t^i = \sum_{s=1}^{N} \frac{E_t\left[\tilde{CF}_{t+s}^i\right]}{\left(1 + l_{t,s} + \theta_{t,s} + \pi_{t,s} + \gamma_{t,s}^i\right)^s}$$

where

- $l_{t,s}$ is the yield to maturity on a real default-free investment today
- $\theta_{t,s}$ is the expected inflation rate between t and $t+s$
- $\pi_{t,s}$ is the compensation for uncertainty in inflation
- $\gamma_{t,s}^i$ is the credit premium

When there is only one cash flow with a known value, the equation simplifies to:

$$P_t^i = \frac{CF_{t+1}}{1 + l_{t,1} + \theta_{t,1} + \pi_{t,1} + \gamma_{t,1}^i}$$

Rearranging for an expression in terms of $\gamma_{t,1}^i$, we have:

$$\begin{aligned}
\gamma_{t,1}^i &= \frac{CF_{t+1}}{P_t^i} - (1 + l_{t,1} + \theta_{t,1} + \pi_{t,1}) \\
&= \frac{100}{93.56} - (1 + 0.015 + 0.020 + 0.0075) \\
&= \mathbf{2.63\%}
\end{aligned}$$

Question 1.2

Per 100 of par value, the difference between the price of the UK corporate bond and a one-year, zero-coupon nominal bond issued by the UK government is *closest* to:

A. GBP 2.19.

B. GBP 2.36. ✓

C. GBP 3.05.

Correct Answer: B

EXPLANATION

Investors who purchase nominal UK government bonds will expect to earn the 1.5% real risk-free as compensation for deferring current consumption, plus 2.0% expected inflation to maintain the real purchasing power of their investment, and 0.75% for inflation uncertainty.

The present value of a GBP 100 face value nominal bond issued by the UK government bond is:

$$\frac{100}{(1 + 1.5\% + 2.0\% + 0.75\%)} = 95.92$$

The difference between the prices of this bond and the corporate bond is:

$$95.92 - 93.56 = \mathbf{2.36}$$

Question 1.3

The breakeven rate of inflation in the UK is *most likely*:

A. 2.00%.

B. 2.75%. ✓

C. 3.50%.

Correct Answer: B

EXPLANATION

The breakeven rate of inflation is defined as the excess yield on a nominal zero-coupon, default-free bond compared to the yield on an otherwise equivalent real bond.

In this case, the real default-free one-year rate is 1.5%. The nominal version of this bond will need to compensate investors 2.0% for expected inflation and an additional 0.75% for inflation uncertainty. Overall, the nominal bond will yield 4.25%, which is **2.75%** higher than the real default-free rate.

Another way to look at this is to understand that the breakeven inflation rates capture both the expected inflation (2.0%) and the uncertainty in future inflation (0.75%). Therefore, the breakeven rate of inflation in this problem is 2.0% + 0.75% = **2.75%**.

Question 1.4

If Kincaid's forecast for the UK economy is accurate, the country's default-free interest rates will *most likely*:

A. increase. ✓

B. decrease.

C. remain unchanged.

Correct Answer: A

EXPLANATION

If the volatility of economic growth in the United Kingdom's economy increases, the average level of default-free real interest rates would likely increase. Intuitively, this makes sense because investors demand a larger discount for cash flows that are more uncertain. Volatility requires a larger risk premium for investors, or equivalently, a large discount rate to determine the present value of the cash flows that depend on uncertain growth projections.

Reading 2 Q2.1–Q2.4

The Mayfair University Foundation's trustees are considering investment opportunities in each of the following countries:

- Country A has a large and developed economy that is not overly reliant on any single sector. GDP growth has been steady over the last three decades. The nominal yields on the country's latest sovereign bond issues are 3.5% for the 5-year maturity (Bond X) and 4.2% for the 20-year maturity (Bond Y).
- Country B has a developing economy that has been able to maintain relatively stable growth rates even as it has increasingly moved toward convergence with developed country levels of GDP on a per capita basis.
- Country C has a rapidly emerging economy that has experienced relatively high levels of volatility as foreign investment has increased significantly in the decade since the last remaining restrictions on capital flows were removed.

Question 2.1

Which country *most likely* has the highest real interest rates?

A. Country A

B. Country B

C. Country C ✓

Correct Answer: C

EXPLANATION

Real interest rates are typically higher in developing economies compared to developed economies. Additionally, all else equal, real interest rates are higher in countries with more volatile GDP growth rates.

Question 2.2

Which country *most likely* has the lowest marginal product of capital?

A. Country A ✓

B. Country B

C. Country C

Correct Answer: A

EXPLANATION

The marginal increase in output from adding an additional unit of capital (holding all else constant) is typically highest in countries with developing economies. As a country's economy becomes more developed and moves into its steady state, its marginal product of capital and real interest rates are expected to decline.

Question 2.3

The *most* accurate interpretation of Country A's upward-sloping yield curve is that investors:

A. may be expecting interest rates to fall. ✓

B. must be expecting interest rates to rise.

C. must be expecting interest rates to rise and require risk premiums that are positively related to maturity.

Correct Answer: A

EXPLANATION

Investors expect to earn risk premiums for uncertainty about future inflation and interest rates. These premiums tend to increase with maturity due to the greater uncertainty over longer periods. Therefore, a downward-sloping yield curve is a clear indication that investors expect interest rates to fall because interest rates are low for longer maturities despite the fact that these rates will reflect higher risk premiums.

However, an upward-sloping yield curve cannot automatically be interpreted as an indication that investors are expecting interest rates to rise. Higher rates for longer maturities are a function of both interest rate expectations and risk premiums. Investors may be expecting interest rates to fall, but the yield curve will still be upward-sloping if the impact of these expectations is more than offset by higher risk premiums.

Question 2.4

Compared to the total return on Bond Y, Bond X's total return is *most likely*:

A. less negatively correlated with Country A's GDP growth.

B. more positively correlated with Country A's GDP growth.

C. more negatively correlated with Country A's GDP growth. ✓

Correct Answer: C

EXPLANATION

Investors value government bonds as a hedge against bad economic times. A security that performed well during economic downturns and poorly during periods of high growth would have a negative correlation, while a perfectly positively correlated investment would offer no hedging value. In general, returns on government bonds are negatively correlated with GDP growth.

Country A's upward-sloping yield curve indicates that shorter-dated bonds like Bond X are more negatively correlated with GDP growth, while longer-dated bonds carry a higher risk premium because they are seen as a less effective hedge against bad economic times.