

Solution key HW#2

CHAPTER 5: INTRODUCTION TO RISK, RETURN, AND THE HISTORICAL RECORD

PROBLEM SETS

4. For the money market fund, your holding period return for the next year depends on the level of 30-day interest rates each month when the fund rolls over maturing securities. The one-year savings deposit offers a 7.5% holding period return for the year. If you forecast that the rate on money market instruments will increase significantly above the current 6% yield, then the money market fund might result in a higher HPR than the savings deposit. The 20-year Treasury bond offers a yield to maturity of 9% per year, which is 150 basis points higher than the rate on the one-year savings deposit; however, you could earn a one-year HPR much less than 7.5% on the bond if long-term interest rates increase during the year. If Treasury bond yields rise above 9%, then the price of the bond will fall, and the resulting capital loss will wipe out some or all of the 9% return you would have earned if bond yields had remained unchanged over the course of the year.

7. $E(r) = [0.35 \times 44.5\%] + [0.30 \times 14.0\%] + [0.35 \times (-16.5\%)] = 14\%$
 $\sigma^2 = [0.35 \times (44.5 - 14)^2] + [0.30 \times (14 - 14)^2] + [0.35 \times (-16.5 - 14)^2] = 651.175$
 $\sigma = 25.52\%$

The mean is unchanged, but the standard deviation has increased, as the probabilities of the high and low returns have increased.

8. Probability distribution of price and one-year holding period return for a 30-year U.S. Treasury bond (which will have 29 years to maturity at year's end):

Economy	Probability	YTM	Price	Capital Gain	Coupon Interest	HPR
Boom	0.20	11.0%	\$ 74.05	-\$25.95	\$8.00	-17.95%
Normal Growth	0.50	8.0%	\$100.00	\$ 0.00	\$8.00	8.00%
Recession	0.30	7.0%	\$112.28	\$12.28	\$8.00	20.28%

9. $E(q) = (0 \times 0.25) + (1 \times 0.25) + (2 \times 0.50) = 1.25$

$$\sigma_q = [0.25 \times (0 - 1.25)^2 + 0.25 \times (1 - 1.25)^2 + 0.50 \times (2 - 1.25)^2]^{1/2} = 0.8292$$

12. The average rates of return and standard deviations are quite different in the sub periods:

STOCKS				
	Mean	Standard Deviation	Skewness	Kurtosis
1926 – 2005	12.15%	20.26%	-0.3605	-0.0673
1976 – 2005	13.85%	15.68%	-0.4575	-0.6489
1926 – 1941	6.39%	30.33%	-0.0022	-1.0716

BONDS				
	Mean	Standard Deviation	Skewness	Kurtosis
1926 – 2005	5.68%	8.09%	0.9903	1.6314
1976 – 2005	9.57%	10.32%	0.3772	-0.0329
1926 – 1941	4.42%	4.32%	-0.5036	0.5034

The most relevant statistics to use for projecting into the future would seem to be the statistics estimated over the period 1976-2005, because this later period seems to have been a different economic regime. After 1955, the U.S. economy entered the Keynesian era, when the Federal government actively attempted to stabilize the economy and to prevent extremes in boom and bust cycles. Note that the standard deviation of stock returns has decreased substantially in the later period while the standard deviation of bond returns has increased.

15. Real interest rates are expected to rise. The investment activity will shift the demand for funds curve (in Figure 5.1) to the right. Therefore the equilibrium real interest rate will increase.