

### Question 1

Weak persistence in open-end mutual fund performance does not necessarily imply that there are no skilled mutual fund managers. Assets tend to flow between funds based on a fund's prospects for strong performance. Investors believe the best indicator of future performance is past performance, so past strong performers tend to see an inflow of assets. All else equal, this growth in assets under management dilutes the fund's performance, because execution is harder. Note, this seeming contradiction does not apply closed-end funds or hedge funds.

### Question 2

There are two types of risks to address: Prepayment Risk (the principal must be repaid in a specific timeframe) and Credit Risk (must be wary of the credit quality in the underlying subprime mortgages). Creating a tranche structure for the cash flows will help to mitigate both risks. Specifically, to protect against prepayment risk, you should create a Planned Amortization Class (PAC) bond along with a companion bond. The PAC bond should be structurally senior to its companion bond. A sequential pay structure would help to achieve this. To protect against credit risk, you should use subordination (make the PAC bond senior to the other tranches).

### Question 3

Money funds follow the straight-line amortization accounting standard, by which investments within 60 days to maturity are not market to market, but rather booked at purchase price, with the return to maturity spread even over the time to maturity. As a result, they pay relatively lower yields, compared to the spot market, when rates increase, making them temporarily less attractive investments. Investors respond with strong outflows during these periods. When short term rates increased, this is what we saw.

### Question 4

- a)  $4,634,004 \text{ shares} / 3 = 1,544,668 \text{ rights offered}$   
 $\text{Min } (\$17.24, \$12.32) = \$12.32$   
 $90\% \times \$12.32 = \$11.088$   
 $(1,544,668 \text{ shares} + 386,167 \text{ shares}) \times \$11.088 = \$21,409,098.48$
- b) First solve for the share price pre-offering:  
 $(4,364,000 \times P + \$21,409,098.48) / (4,364,004 + 1,544,668 + 386,167 \text{ shares}) = \$12.32$   
Initial  $P = \$12.833$   
 $(\$12.8333 - \$12.32) \times 1,000 \text{ shares} = \$513.33$   
The shareholder has lost \$513.33 in wealth by not participating in the offering
- c) Yes, the shareholder lost money by not exercising his rights, and he could have recouped this loss by selling his rights on the open market. As he loses money by not participating, it is a coercive offer.

Question 5

Solvent banks can still have a problem with bank run, because liquidity is the issue – banks invest in illiquid assets and don't have enough cash on hand to allow everyone to withdraw all their money at the same time.

However, the following policies can help in preventing bank runs or reducing their impact:

1. Suspension of convertibility: Bank can announce that it will allow only a certain number of depositors to withdraw money, or set a limit on how much any depositor can withdraw per day.
  - a. But, this is difficult to implement because banks don't know which depositor truly needs money
2. Lender of Last resort: Banks can borrow money from other banks. If they refuse to lend, they can go to the Federal Reserve, which serves as the 'Lender of Last Resort' in this country. However,
  - a. Fed reserves the right not to lend (although this risk is lower if the bank is solvent)
  - b. The borrowed money needs to be repaid within a short period of time, so the depositors have to regain their confidence and return quickly
3. Deposit Insurance: Deposit insurance guarantees deposits up to a limit. An FDIC insured bank has a guarantee for the first \$100K of each depositor's money. So, there is no reason for any depositor with less than \$100K to join the bank run.
  - a. But large depositors, who usually comprise a large fraction of many bank's deposits, still have reason to run.

The following concepts, though not necessary, received a bonus (total marks not exceeding 10):

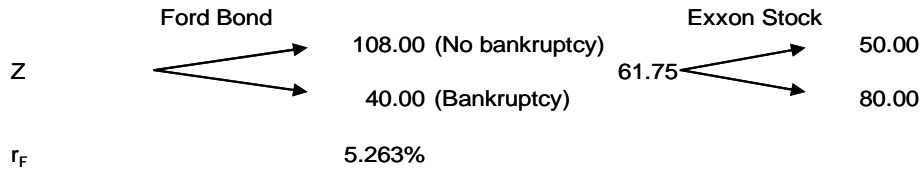
Problems caused by solutions to Bank Runs:

1. Too big to fail
2. Risk shifting

Question 6

6)

a)



Create a Portfolio of B risk-free Bonds and S Exxon shares

Solve for X and Y Using Simultaneous Equations:

$$\begin{aligned} 108 &= 50.00 S + 1.05 B \\ 40 &= 80.00 S + 1.05 B \end{aligned}$$

$$68 = S^* (30.00)$$

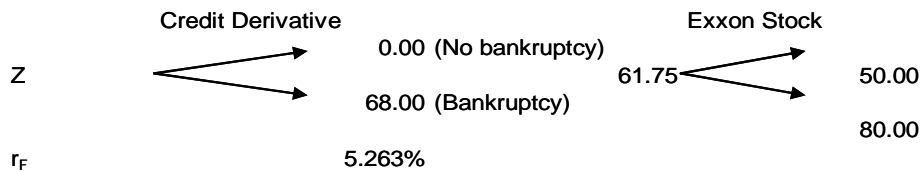
$$\begin{aligned} S &= -2.266667 \\ B &= 210.79365 \end{aligned} \quad \text{Check: } X = -2.26667$$

Cost of Portfolio:

$$\text{Total Cost} = (S * \text{Price}_S) + (B * \text{Price}_B)$$

**Total Cost = 70.827**

b)



Create a Portfolio of B risk-free Bonds and S Exxon shares

Solve for X and Y Using Simultaneous Equations:

$$\begin{aligned} 0.00 &= 50.00 S + 1.05 B \\ 68.00 &= 80.00 S + 1.05 B \end{aligned}$$

$$-68 = S^* (30.00)$$

$$\begin{aligned} S &= 2.266667 \\ B &= -107.93651 \end{aligned} \quad \text{Check: } X = 2.26667 \quad -113.617$$

Cost of Portfolio:

$$\text{Total Cost} = (S * \text{Price}_S) + (B * \text{Price}_B)$$

**Total Cost = 32.030**

Using probability (described below) to calculate the cost of the bond is incorrect!

$$\begin{aligned} \text{Probability of bankruptcy} &= 50\% \\ \text{Expected value of Ford Bond} &= (108 * 50\%) + (40 * 50\%) \\ &= 74 \\ \text{Present value} &= 74 / (1 + r_f) \\ &= 74 / 1.05263 \\ &= 70.30011 \end{aligned}$$

The probability is not known, so you can't assume it to be 50%. The answer looks suspiciously similar to the correct answer, but that is a coincidence.

Question 7.

The 11.125% bond can be defeased by depositing an appropriate amount of Treasuries in an irrevocable trust. To find the exact number and type, note the following (cashflow) relationship between the 3% Treasury (“A”), the STRIP (“S”) and the 11.125% bond to be defeased (“D”).

$$D = (11.125/3) * (A - S) + S \Rightarrow D = 3.708 * A - 2.708 * S$$

So to defease \$1,000 of D we will need to spend  $(1000/100) * (3.708 * (97 \frac{4}{32}) - 2.708 * (92 \frac{16}{32})) = 1,096.50$ . Savings are therefore

$$(118,968,000/1000) * (1096.50 - 1087.06) \approx \$1,123,000.$$

Note that accrued interest cancels out on both ends of the trade so no need to calculate it explicitly.

Question 8.

**a) The ASK** is calculated as the price at which the different “groups” of investors are ready to buy weighted by their relative size in the market:  $ASK = 4 + 7.2 + 24.5 = \$35.70$ .

Insiders:  $(\$40 * 100\% + \$30 * 0\%) * 10\% = 4.0$   
Professionals:  $(\$40 * 60\% + \$30 * 40\%) * 20\% = 7.2$   
Retail Investors:  $(\$40 * 50\% + \$30 * 50\%) * 70\% = 24.5$

**Similarly, the BID** is calculated as the price at which the different “groups” of investors are ready to sell weighted by their relative size in the market:  $BID = 3 + 6.8 + 24.5 = \$34.30$ .

Insiders:  $(\$40 * 0\% + \$30 * 100\%) * 10\% = 3.0$   
Professionals:  $(\$40 * 40\% + \$30 * 60\%) * 20\% = 6.8$   
Retail Investors:  $(\$40 * 50\% + \$30 * 50\%) * 70\% = 24.5$

**b)** When buying, a professional makes  $(\$40 * 60\% + \$30 * 40\%) - 35.70 = \$0.30$ . When selling, they make  $34.30 - (\$40 * 40\% + \$30 * 60\%) = \$0.30$ .