

ECON 612: MONEY AND BANKING
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EXAMPLE 8.7*
SOLUTIONS AND EXPLANATIONS

COLOR LEGEND

- ⌘ HEADINGS
- ⌘ GIVEN/PREVIOUSLY FOUND INFORMATION
- ⌘ CONCEPTS YOU SHOULD ALREADY KNOW
- ⌘ ANSWER
- ⌘ ANNOTATIONS AND EXTRA EXPLANATIONS

* A COPY OF THE PROBLEMS IS ATTACHED AT THE END OF THIS DOCUMENT. THERE MAY BE SOME DIFFERENCES BETWEEN THIS VERSION AND THE ONE AVAILABLE ON CANVAS.

GIVEN INFORMATION

$$D_S = \$100$$

$$D_J = \$1,000$$

$$DV = \$200$$

$$S = \$1,100$$

$$P(S) = 0.9$$

$$F = \$0$$

$$P(F) = 0.1$$

$$C = \$5$$

I GIVEN INFORMATION

NO RESTRUCTURING

a FINDING VE

$$\begin{aligned} VE &= P(S)[S - (D_S + D_J)] - C \\ &= 0.9[1100 - (100 + 1000)] - 5 \end{aligned}$$

$$VE = -5$$

CONCLUSION

BECAUSE $VE < 0$, THE ENTREPRENEUR WILL NOT PARTICIPATE.

b FINDING LIQUIDATION PREFERENCE

PREFER TO LIQUIDATE IF $D > P(S)D_S$

$$D_S > P(S)D_S$$

$$100 > 0.9(100)$$

$100 \neq 90 \therefore$ PREFER LIQUIDATION

c FINDING BANK'S PAYOFF

$$BP = DV - D_S$$

$$= 200 - 100$$

$BP = \$100$ BECAUSE THIS IS LESS THAN D_J , THE BANK MAY PREFER TO RESTRUCTURE IN HOPES OF RECEIVING MORE OF THEIR MONEY.

2 GIVEN INFORMATION

BANK BUYS SENIOR DEBT

a FINDING D_R

INDIFFERENT WHEN $P(S)(S - D_R) - C = 0$

$$0.9(1100 - D_R) - 5 = 0$$

$$D_R = 1094.444\dots$$

$$D_R \approx \$1,094.44$$

FINDING d

$$d = (D_J + D_S) - D_R$$

$$= (100 + 1000) - 1094.444\dots$$

$$d = \$5.55\ldots$$

$$d = \$5.56$$

b FINDING BANK'S PAYOFF

$$\begin{aligned}BP &= P(s)(D_s + D_j - d) - D_s \\&= 0.9(100 + 1000 - 5.555\ldots) - 100\end{aligned}$$

$$BP = \$855$$

Example 8.7

Consider Marvelous Computers managed by Mr. Bill Doors. The firm has two kinds of debt outstanding: senior debt under which it owes \$100 to bondholders, and a subordinated bank loan that requires a repayment of \$1,000. The assets of Marvelous Computers have a current liquidation value of \$200, but if the firm continues to operate, it will be worth \$1,100 with probability 0.9 and zero with probability 0.1 one period hence. To manage the firm for an additional period, Mr. Doors incurs a personal cost of \$5. Mr. Doors has declared that he wishes to file for bankruptcy and has contacted both the bank and the bondholders' trustee. The bondholders wish to liquidate the firm immediately.

What should the bank do? Assume universal risk neutrality and a risk-free interest rate of zero. Mr. Doors owns all of the firm's equity.

- (1) Consider that the firm does not do any restructuring. Answer the following:
 - (a) Will the entrepreneur participate?
 - (b) Do the bondholders prefer to continue or liquidate?
 - (c) Given the above, what does the bank receive?
- (2) Consider that the firm goes through with efficient reorganization and the bank buys the senior debt. Answer the following:
 - (a) How much does the bank have to reduce the debt by to make the entrepreneur participate?
 - (b) What is the bank's payoff after they reduce the debt?