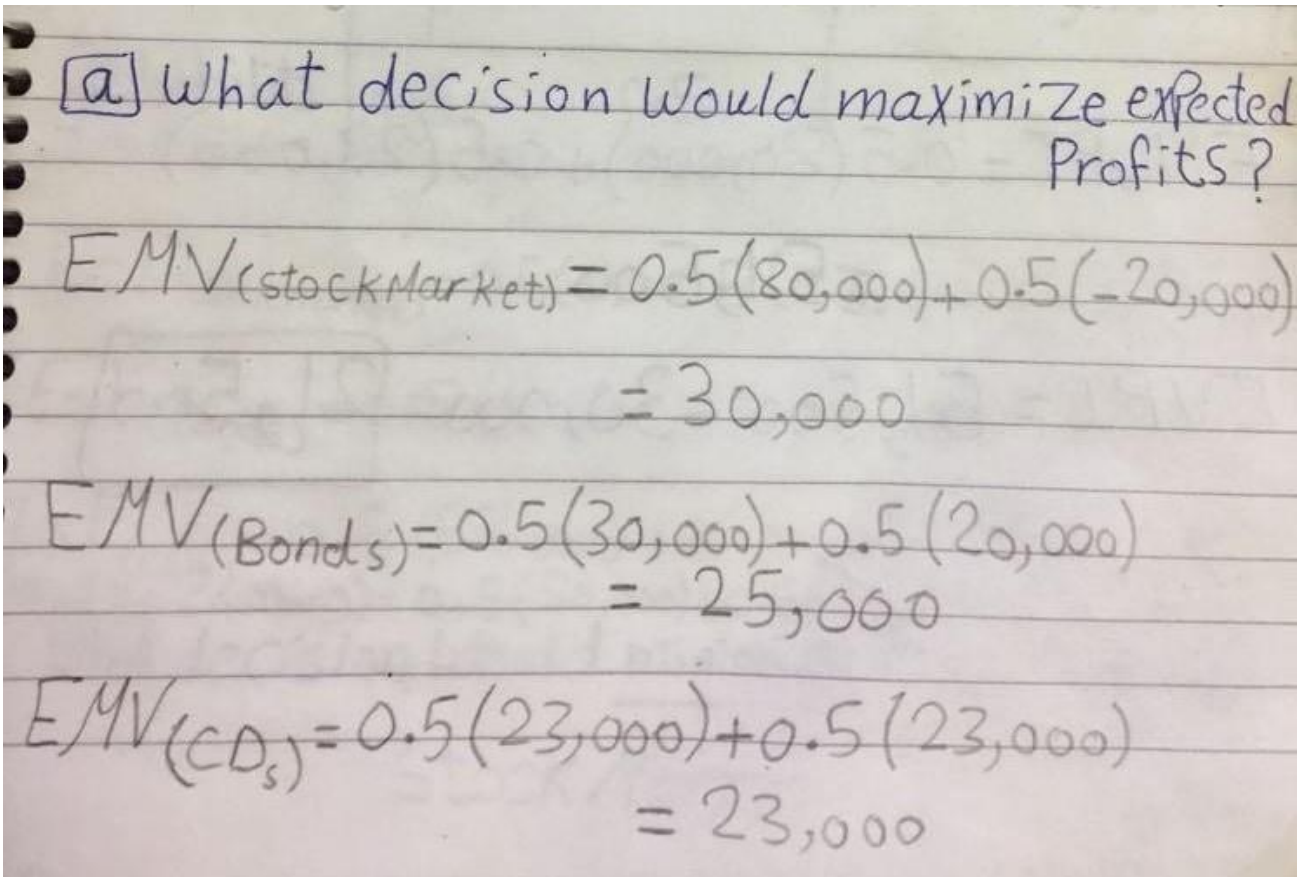
3-20

Mickey Lawson is considering investing some money that he inherited. The following payoff table gives the profits that would be realized during the next year for each of three investment alternatives Mickey is considering:

	STATE OF NATURE	
DECISION ALTERNATIVE	GOOD ECONOMY	POOR ECONOMY
Stock market	80,000	–20,000
Bonds	30,000	20,000
CDs	23,000	23,000
Probability	0.5	0.5

(a) What decision would maximize expected profits?
(b) What is the maximum amount that should be paid for a perfect forecast of the economy?



So he should invest in stock Market which has the highest EMV to maximize expected Profit

[B] What is the maximum amount that Should be Paid for a Perfect forecast of the economy ?

$$EVPI = EV_wPI - EMV$$

$$EV_wPI = 0.5(80,000) + 0.5(23,000)$$

$$= 51,500$$

$$EVPI = 51,500 - 30,000 = \boxed{21,500}$$

3-21 Develop an opportunity loss table for the investment problem that Mickey Lawson faces in Problem 3-20. What decision would minimize the expected opportunity loss? What is the minimum EOL?

3.21

(A) Develop an opportunity loss table for Problem 3.20

Decision alternative	Good	Poor	EoL
Stock market	0	43,000	21,500
Bonds	50,000	3,000	26,500
CDs	57,000	0	28,500
Probability	0.5	0.5	

$EoL_{(stock\ market)} = 0.5(0) + 0.5(43,000) = 21,500$

$EoL_{(Bonds)} = 0.5(50,000) + 0.5(3,000) = 26,500$

$EoL_{(CDs)} = 0.5(57,000) + 0.5(0) = 28,500$

What decision would minimize the expected opportunity loss?

Stock Market

(B) What is the minimum EoL?

Minimum EoL is 21,500 Stock Market

Question

	Outcomes		
Alternative	Increase	Lose	Remain
A	80	10	10
B	10	70	20
C	10	20	70
Probabilities	0.4	0.3	0.3

a) Determine the optimal decision using expected monetary values.
b) Find the EVPI
C) Construct a loss table and find the min EOL.

Solution:

a) Calculate EMV for each alternative then choose the alternative with the **highest EMV** to be the optimal decision.

EMV(A) = 80(0.4) + 10(0.3) + 10(0.3) = 38
EMV(B) = 10(0.4) + 70(0.3) + 20(0.3) = 31
EMV(C) = 10(0.4) + 20(0.3) + 70(0.3) = 31

-----→ the optimal decision is alternative A (EMV = 38)

b) EVPI = EVwPI–Maximum EMV
Maximum EMV = 38
EVwPI = 80(0.4) + 70(0.3) + 70(0.3) = 74

----→ EVPI = 74 – 38 = 36

c) 1) create opportunity loss table
2) calculate EOL for each alternative
3) Choose alternative with **Minimum EOL**

Alternative	Increase	Lose	Remain
A	0	60	60
B	70	0	50
C	70	50	0
Probabilities	0.4	0.3	0.3

EOL(A) = 0(0.4) + 60(0.3) + 60(0.3) = 36
EOL(B) = 70(0.4) + 0(0.3) + 50(0.3) = 43
EOL(C) = 70(0.4) + 50(0.3) + 0(0.3) = 43

----→ the minimum EOL is alternative A with EOL = 36

Note:
1- The value of minimum EOL is equal to the value of EVPI.
2- The minimum EOL decision is the same as the maximum EMV decision.