

Maximax

Decision	States of Nature		Maximum in Row
	Favorable	Unfavorable	
Large plant	\$200,000	-\$180,000	\$200,000
Small plant	\$100,000	-\$20,000	\$100,000
No plant	\$0	\$0	\$0

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Large plant	\$200,000	-\$180,000	-\$180,000
Small plant	\$100,000	-\$20,000	-\$20,000
No plant	\$0	\$0	\$0

Equal Likelihood

Decision	States of Nature		Row Average
	Favorable	Unfavorable	
Large plant	\$200,000	-\$180,000	\$10,000
Small plant	\$100,000	-\$20,000	\$40,000
No plant	\$0	\$0	\$0

Large plant=(200,000-180,000)/2=\$10,000  
Small plant=(100,000-20,000)/2=\$40,000  
Large plant=(0+0)/2=\$0

Criterion of Realism

Decision	States of Nature		Criterion of Realism
	Favorable	Unfavorable	
Large plant	\$200,000	-\$180,000	\$124,000
Small plant	\$100,000	-\$20,000	\$76,000
No plant	\$0	\$0	\$0

Large plant=(0.8)(200,000)+(0.2)(-180,000)=\$124,000  
Small plant=(0.8)(100,000)+(0.2)(-20,000)=\$76,000  
Do nothing=(0.8)(0)+(0.2)(0)=\$0

Minimax Regret

Decision	States of Nature				
	Favorable		Unfavorable		Row Maximum
	Payoff	Regret	Payoff	Regret	
Large plant	\$200,000	\$0	-\$180,000	\$180,000	\$180,000
Small plant	\$100,000	\$100,000	-\$20,000	\$20,000	\$100,000
No plant	\$0	\$200,000	\$0	\$0	\$200,000
Best Payoff	\$200,000		\$0		



Actions	Type of Market		Expected Monetary Value EMV (Q) <small>Q(action a) = (reward of 1st state of nature) X (probability of 1st state of nature) + (reward of 2nd state of nature) X (probability of 2nd state of nature) + ... + (reward of last state of nature) X (probability of last state of nature)</small>
	Favorable	Unfavorable	
Build a large plant	200,000	-180,000	$200,000 \times 0.5 + -180,000 \times 0.5 = \mathbf{10,000}$
Build a small plant	100,000	-20,000	$100,000 \times 0.5 + -20,000 \times 0.5 = \mathbf{40,000}$
Do nothing	0	0	$0 \times 0.5 + 0 \times 0.5 = \mathbf{0}$
Maximum	200,000	0	
Decision	Maximum EMV (Q) is 40,000 corresponding to a decision build a small plant		
Probability	0.5	0.5	

<b>EVPI Computation</b>		
EV w/ PI =	<b>EV w/ PI =</b> (best reward for 1st state of nature) X (probability of 1st state of nature) + (best reward for 2nd state of nature) X (probability of 2nd state of nature)	$200,000 \times 0.5 + 0 \times 0.5 = \mathbf{100,000}$
Expected Value of Perfect information (EVPI)  EVPI = EV w/ PI - Q		EVPI = $\mathbf{100,000 - 40,000 = 60,000}$
Cost of Perfect Information (assumption c/o Mam Ortiz)		20,000
Net gain with perfect information $60,000 - 20,000 = 40,000$		$60,000 - 20,000 = \mathbf{40,000}$
Buy perfect information? (Yes / No)		YES, with the PI, my gain is doubled. An increase of 100% will be gained with the perfect information, giving a total gain of 80,000.