Q1

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A company has developed two types of synthetic fuel. However it has not developed efficient manufacturing processes for either of them. It has has the option to develop the manufacturing process for both, either or none of them.  They estimate that if they try to develop a process for fuel A then their probability of success is 0.46. If they do succeed then they expect that they could sell the process to another company for $43,600. Alternatively they could manufacture the fuel themselves, in which case they estimate that if the market is strong then they will achieve a revenue stream with a net present value (NPV) of $68,200, or if the market is week a NPV of $28,100. They estimate the probability of the market being strong for fuel A as being 0.45. Attempting to develop the process is expected to cost $38,800. This amount needs to be deducted from all of the above returns to determine the profit for each situation.  They estimate that if they try to develop a process for fuel B then their probability of success is 0.55. If they do succeed then they expect that they could sell the process to another company for $55,000. Alternatively they could manufacture the fuel themselves, in which case they estimate that if the market is strong then they will achieve a revenue stream with a net present value (NPV) of $83,600, or if the market is week a NPV of $41,751. They estimate the probability of the market being strong for fuel B as being 0.6. Attempting to develop the process is expected to cost $34,800. This amount needs to be deducted from all of the above returns to determine the profit for each situation.  The probabilities for success in developing the two fuels are independent and the returns will be the same as given above. If they succeed in developing processes for both fuels they will only be able to manufacture one for legal reasons. They will have to sell the other one to another company at the value price given above.  What is the EMV of attempting to develop a process for  fuel A only? (Answer to nearest dollar)    What is the EMV of attempting to develop a process for fuel B only? (Answer to nearest dollar)    What is the EMV of attempting to develop a process for both fuels? (Answer to nearest dollar)    What should the company do?   |  |  |  |  | | --- | --- | --- | --- | |  |  |  | Develop B only | |  |  |  | Nothing | |  |  |  | Develop both | |  |  |  | Deveolp A only |     Please note that it entirely possible that some EMVs calculated above will be negative (ie losses) |

Q2

A particular security gives an average return of $14.65 per year and has a beta of 0.5. The return on the market portfolio is 0.07 and the risk free rate is 0.05. What should be the value of this security? (Answer to 2 decimal places) 

What would your answer for the value of the security be if you were given the additional information that the probabilitity of default is 0.04? (Answer to 2 decimal places)  