FINANCIAL ANALYSIS

*Referring to the three projects, create a financial analysis for each projects using the Financial-Analysis-NPV-ROI.xlsxPreview the document template (UPDATE SUNDAY, AUGUST 25, 2019). For each project calculate the (a) NPV, (b) ROI, and (c) year in which payback on each project occurs. In addition, (d) determine which project you would recommend pursuing in based on the analysis and explain why.*

Financial Analyses (NPV, ROI, and Payback Year) - Project A

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| **Discount rate** | 5.00% |  |  |  |  |  |
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|  |  |  |  |  |  |  |
| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 100,000 | 75,000 | 75,000 | 75,000 | 75,000 | **400,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted costs** | **100,000** | **71,429** | **68,027** | **64,788** | **61,703** | **365,946** |
| Cumulative Discounted Costs | 100,000 | 171,429 | 239,456 | 304,244 | 365,946 |  |
|  |  |  |  |  |  |  |
| Benefits | 200,000 | 50,000 | 25,000 | 100,000 | 100,000 | **475,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted benefits** | **200,000** | **47,619** | **22,676** | **86,384** | **82,270** | **438,949** |
| Discounted benefits - costs | 100,000 | (23,810) | (45,351) | 21,596 | 20,568 | **73,003** |
| Cumulative discnt benefits - costs | 100,000 | 76,190 | 30,839 | 52,435 | 73,003 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **100%** | **44%** | **13%** | **17%** | **20%** |  |

Therefore, for project A,

The NPV = 73,003;

The ROI = 20%, the annual ROI is 100% for year 0, 44% for year 1, 13% for year 2, 17% for year 3, 20% for year 4;

And the payback year is year 0.

Financial Analyses (NPV, ROI, and Payback Year) - Project B

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| **Discount rate** | 5.00% |  |  |  |  |  |
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| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 300,000 | 50,000 | 25,000 | 15,000 | 10,000 | **400,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted costs** | **300,000** | **47,619** | **22,676** | **12,958** | **8,227** | **391,479** |
| Cumulative Discounted Costs | 300,000 | 347,619 | 370,295 | 383,252 | 391,479 |  |
|  |  |  |  |  |  |  |
| Benefits | 125,000 | 125,000 | 110,000 | 110,000 | 5,000 | **475,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted benefits** | **125,000** | **119,048** | **99,773** | **95,022** | **4,114** | **442,957** |
| Discounted benefits - costs | (175,000) | 71,429 | 77,098 | 82,065 | (4,114) | **51,477** |
| Cumulative discnt benefits - costs | (175,000) | (103,571) | (26,474) | 55,591 | 51,477 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **-58%** | **-30%** | **-7%** | **15%** | **13%** |  |

Therefore, for project B,

The NPV = 51,477;

The ROI = 13%, the annual ROI is -58% for year 0, -30% for year 1, -7% for year 2, 15% for year 3, 13% for year 4;

And the payback year is year 3.

Financial Analyses (NPV, ROI, and Payback Year) - Project C

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| **Discount rate** | 5.00% |  |  |  |  |  |
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| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 100,000 | 100,000 | 100,000 | 75,000 | 25,000 | **400,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted costs** | **100,000** | **95,238** | **90,703** | **64,788** | **20,568** | **371,296** |
| Cumulative Discounted Costs | 100,000 | 195,238 | 285,941 | 350,729 | 371,296 |  |
|  |  |  |  |  |  |  |
| Benefits | 0 | 50,000 | 75,000 | 150,000 | 200,000 | **475,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted benefits** | **-** | **47,619** | **68,027** | **129,576** | **164,540** | **409,762** |
| Discounted benefits - costs | (100,000) | (47,619) | (22,676) | 64,788 | 143,973 | **38,466** |
| Cumulative discnt benefits - costs | (100,000) | (147,619) | (170,295) | (105,507) | 38,466 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **-100%** | **-76%** | **-60%** | **-30%** | **10%** |  |

Therefore, for project C,

The NPV = 38,466;

The ROI = 10%, the annual ROI is -100% for year 0, -76% for year 1, -60% for year 2, -30% for year 3, 10% for year 4;

And the payback year is year 4.

Overall, I would recommend pursuing project A. Because project A has the highest NPV, the highest ROI and the earliest payback year.

*Next, complete an additional analysis of each project assuming the following Discount Rates; Project A=9%, Project B=2.5%, and Project C=5%. For each project calculate the (e) NPV, (f) ROI, and (g) year in which payback on each project occurs. In addition, (h) determine which project you would recommend pursuing in based on the analysis and why. Explain how the change in discount rates has impacted your original assessment.*

Different Discount Rate Analysis – Project A

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| **Discount rate** | 9.00% |  |  |  |  |  |
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| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 100,000 | 75,000 | 75,000 | 75,000 | 75,000 | **400,000** |
| Discount factor | 1.00 | 0.92 | 0.84 | 0.77 | 0.71 |  |
| **Discounted costs** | **100,000** | **68,807** | **63,126** | **57,914** | **53,132** | **342,979** |
| Cumulative Discounted Costs | 100,000 | 168,807 | 231,933 | 289,847 | 342,979 |  |
|  |  |  |  |  |  |  |
| Benefits | 200,000 | 50,000 | 25,000 | 100,000 | 100,000 | **475,000** |
| Discount factor | 1.00 | 0.92 | 0.84 | 0.77 | 0.71 |  |
| **Discounted benefits** | **200,000** | **45,872** | **21,042** | **77,218** | **70,843** | **414,974** |
| Discounted benefits - costs | 100,000 | (22,936) | (42,084) | 19,305 | 17,711 | **71,995** |
| Cumulative discnt benefits - costs | 100,000 | 77,064 | 34,980 | 54,285 | 71,995 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **100%** | **46%** | **15%** | **19%** | **21%** |  |

Therefore, for project A at 9% discount rate,

The NPV = 71,995;

The ROI = 21%, the annual ROI is 100% for year 0, 46% for year 1, 15% for year 2, 19% for year 3, 21% for year 4;

And the payback year is year 0.

Different Discount Rate Analysis – Project B

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| **Discount rate** | 2.50% |  |  |  |  |  |
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| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 300,000 | 50,000 | 25,000 | 15,000 | 10,000 | **400,000** |
| Discount factor | 1.00 | 0.98 | 0.95 | 0.93 | 0.91 |  |
| **Discounted costs** | **300,000** | **48,780** | **23,795** | **13,929** | **9,060** | **395,564** |
| Cumulative Discounted Costs | 300,000 | 348,780 | 372,576 | 386,505 | 395,564 |  |
|  |  |  |  |  |  |  |
| Benefits | 125,000 | 125,000 | 110,000 | 110,000 | 5,000 | **475,000** |
| Discount factor | 1.00 | 0.98 | 0.95 | 0.93 | 0.91 |  |
| **Discounted benefits** | **125,000** | **121,951** | **104,700** | **102,146** | **4,530** | **458,326** |
| Discounted benefits - costs | (175,000) | 73,171 | 80,904 | 88,217 | (4,530) | **62,762** |
| Cumulative discnt benefits - costs | (175,000) | (101,829) | (20,925) | 67,292 | 62,762 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **-58%** | **-29%** | **-6%** | **17%** | **16%** |  |

Therefore, for project B at 2.5% discount rate,

The NPV = 62,762;

The ROI = 16%, the annual ROI is -58% for year 0, -29% for year 1, -6% for year 2, 17% for year 3, 16% for year 4;

And the payback year is year 3.

Different Discount Rate Analysis – Project C

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| **Discount rate** | 5.00% |  |  |  |  |  |
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|  |  |  |  |  |  |  |
| **Year** | **0** | **1** | **2** | **3** | **4** | **Totals** |
| Costs | 100,000 | 100,000 | 100,000 | 75,000 | 25,000 | **400,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted costs** | **100,000** | **95,238** | **90,703** | **64,788** | **20,568** | **371,296** |
| Cumulative Discounted Costs | 100,000 | 195,238 | 285,941 | 350,729 | 371,296 |  |
|  |  |  |  |  |  |  |
| Benefits | 0 | 50,000 | 75,000 | 150,000 | 200,000 | **475,000** |
| Discount factor | 1.00 | 0.95 | 0.91 | 0.86 | 0.82 |  |
| **Discounted benefits** | **-** | **47,619** | **68,027** | **129,576** | **164,540** | **409,762** |
| Discounted benefits - costs | (100,000) | (47,619) | (22,676) | 64,788 | 143,973 | **38,466** |
| Cumulative discnt benefits - costs | (100,000) | (147,619) | (170,295) | (105,507) | 38,466 |  |
|  |  |  |  |  |  |  |
| **Return on Investment (ROI)** | **-100%** | **-76%** | **-60%** | **-30%** | **10%** |  |

Therefore, for project C at 5% discount rate,

The NPV = 38,466;

The ROI = 10%, the annual ROI is -100% for year 0, -76% for year 1, -60% for year 2, -30% for year 3, 10% for year 4;

And the payback year is year 4.

Overall, I would recommend pursuing project A. Because project A has the highest NPV, the highest ROI and the earliest payback year. And when costs and benefits remain the same, increasing discount rate will lead to a lower discount factor and lower discounted costs and benefits which will impact project NPV and ROI.

WEIGHTED SCORING

*Complete a weighted scoring analysis to determine which project to select using the Weighted-Scoring.xlsxPreview the document template. Assume the criteria include (i) quality, (ii) strategic value, (iii) risk, and (iv) financial assessment with weights of 30%, 25%, 15%, and 30%, respectively. The scores for Project A include 80, 75, 75, and 80; Project B include 60, 90, 90, and 60; and Project C include 95, 60, 92, and 50 for each criterion. Calculate the weighted score, and graph the results. Determine which project you would recommend pursuing in based on the analysis and explain why.*

Weighted Scoring for 15%, 40%, 20% & 25% Criteria Weights

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Weight** | **Project 1** | **Project 2** | **Project 3** |
| Quality | 30% | 80 | 60 | 95 |
| Strategic Value | 25% | 75 | 90 | 60 |
| Risk | 15% | 75 | 90 | 92 |
| Financial Assessment | 30% | 80 | 60 | 50 |
| **Weighted Project Scores** | **100%** | **78** | **72** | **72.3** |
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Based on the weighted scoring analysis, I would recommend pursuing project 1 because it has the highest weighted scores.

*Next, recompute the model with the same criteria of (i) quality, (ii) strategic value, (iii) risk, and (iv) financial assessment, but with new weights of 15%, 30%, 40%, and 15%, respectively. Determine which project you would recommend pursuing in based on the analysis and explain why. Explain how the change in weightings has impacted your original assessment.*

Weighted Scoring for 40%, 10%, 10% & 40% Criteria Weights

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Weight** | **Project 1** | **Project 2** | **Project 3** |
| Quality | 15% | 80 | 60 | 95 |
| Strategic Value | 30% | 75 | 90 | 60 |
| Risk | 40% | 75 | 90 | 92 |
| Financial Assessment | 15% | 80 | 60 | 50 |
| **Weighted Project Scores** | **100%** | **76.5** | **81** | **76.55** |
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Based on the weighted scoring analysis, I would recommend pursuing project 2 because it has the highest weighted scores. The weighting of Quality and Financial Assessment decreased while the weighting of Strategic Value and Risk increased lead to a scoring model that benefits project 2. Therefore project 2 gets the highest weighted scores after the calculation.