

# Lockerheed tristar case study essay sample

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Professor Gupta, many organizations use financial methods to determine the viability of projects and decisions based in the initial required investment. The financial industry has many standards regarding these methods, with the most commonly used being Internal Rate of Return (IRR) and Net Present Value (NPV). Each method encompasses positives and negatives; however if either are used without fully understanding what their prospective results reveal, mistakes can be made and under-estimations of return will happen. In a recent case Lockheed Martin chose to use the Internal Rate of Return to value their Tri Star project. We have determined this to be a mistake and, through this case analysis, will show where the mistake happened. We also intend to explain how using the Net Present Value method will uncover a different, more realistic picture of the project's return.

#### Introduction/Motivation

Capital investment decisions are long term finance decisions designed to strategically invest in projects that will improve the value of the corporation for stockholders. There are several methods for determining which projects are worth investing in, but the best methods must take into account the net present value of the future cash flows resulting from the investment using an appropriate discount rate for the project and managements assessment of the risk involved. In the Lockheed case, which we will examine in detail below, the management made a decision to proceed with the Tri Star project based on a break-even analysis. As we will show, their analysis was flawed, failing to take into account the net present value of their investments resulting in a huge loss of value for the company.

#### Data/Analysis Section

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In breaking out the data as referenced in the Harvard Business case study from the Lockheed Tri-Star situation, organizing the cash flows in a spreadsheet depiction offered the most clarity in analyzing the information.

As seen above, @ 210 aircraft produced over the above time period, the \$900mm in up front costs are spread over the first 5 years (1967-1971), annual unit production costs of \$490mm are spread over 6 years (1971-1976), and revenues are divided up in both 25% deposits (\$140mm/yr from 1970-1975) and the balance of those revenues (\$420mm/yr from 1972-1977).

In analyzing the cash flows @ 210 aircraft for those 10 years keeping in mind the 10% assumed cost of capital to Lockheed, the NPV of the project was - \$530, 950, 000; the IRR of the project was -9%, and the project lost \$480, 000, 000 when netting the costs of the project with the revenues.

In the scenario where production is assumed @ 300 aircraft for that time period, the \$900mm in upfront costs remains over the first 6 years, however unit production costs rise a bit to \$625mm/year (\$12. 5mm/aircraft at 50 aircraft/year) as do revenues assuming all built aircraft are sold at that same \$16mm price/aircraft and in a similar deposit and balance paid scenario.

In analyzing the cash flows @ 300 aircraft for those 10 years assuming the same 10% cost of capital, the NPV of the project improved but remains negative at -\$249, 440, 000, the IRR remains sub par at 2%, but the accounting break even analysis actually shows a small profit of \$150, 000, 000.

The management's breakeven analysis determined that 210 units would need to be sold to start making money on the Tri Star project. However, if the Net Present Value of the project is used in this analysis as shown above, it is clear that an excess of 378 units would need to be sold in order to make the net present value of the project come out positive. At this level of production, it was assumed that the per unit cost of production would be further reduced to \$11.75 million.

## Conclusion

The investment decision made by Lockheed to proceed with the Tri Star project was not very well thought through. Even though break even production was calculated to be 210 units, a true value analysis shows that this number was much lower than the production actually needed to break even. In addition, the market conditions were grossly overestimated. They anticipated a rapid growth in the airline industry that was unsupported by the economic conditions during the 1970s. Ultimately this poor decision resulted in dramatic loss of wealth for the Lockheed shareholders totaling a loss of \$757 million in stock value.

## APPENDIX

### I. Rainbow Products—Case Analysis

Rainbow Products is considering the purchase of a paint-mixing machine to reduce labor costs. In addition to simply analyzing the purchase of the machine alone, Rainbow also has the option to purchase a service contract along with the machine or, instead, choose to reinvest some of the

productivity savings from the equipment back into the machinery in lieu of service. Here is the analysis of all three scenarios. What we know:

Annual CF=\$5, 000

Initial cost=\$35, 000

N= 15 years

i= 12%

A. Payback, NPV, and IRR of paint-mixing machine.

i. Payback of the machinery is 7 years ( $\$35,000/\$5,000$ )

ii. NPV of the machinery is \$-945. 67 (CFO=-35, 000; CF1-CF15= 5, 000;

IRR= 12) iii. IRR of the machinery is 11. 49

Conclusion: Based on both the NPV and the IRR of the machine, Rainbow should reject this purchase. B. NPV of paint mixing machine including a

service contract i. NPV =  $\$2,000 = -35,500 + 37,500$

Conclusion: Based on the NPV, Rainbow should purchase the machine with the service contract.

C. NPV of paint mixing machine and reinvestment of savings in lieu of service contract. i. NPV= $\$15,000 = -35,000 + 50,000$

Conclusion: Based on NPV, Rainbow should reinvest 20% of the cost savings into its machine annually.

## II. Concession Stand—Case Analysis

For part 2, you own a concession stand that sells hot dogs, popcorn, peanuts and beer at a ball park. There are only three years left on your contract. The current stands architecture has restricted sales and profits due the inability to efficiently service long lines. Four proposals to deal with this issue were

devised and are listed below. Using the incremental cash flows for years 1-3 and a discount rate of 15%, you must recommend what proposal to take. A recommendation should be based off an analysis using the IRR rule only and then with the NPV rule. Any differences between the rankings should be explained.

As shown the table, an additional proposal is listed, which is a combination of options one and two. Options one and two are the only two projects that were not mutually exclusive, which is why a fifth option was created. In addition, the IRR and NPV for the respective options were calculated and included in the table. Using the Internal rate of return (IRR)

Using the internal rate of return rule, renting the larger stand is what we would recommend. This proposal yielded the highest IRR. The remainder of the proposals had positive IRR's as well. This suggests that the opportunity costs of capital are less than the internal rate of return, making any of them a worthy project to accept. Using the Net Present Value (NPV)

Based off the Net Present Value (NPV) rule, we would recommend option 4, which is to build a new stand. The NPV for this option is 34, 826, which is greater than any of the other options, including options one and two combined. Since the other options also have positive NPV's, they could very well be worthwhile projects but ranked lower than option 4. Differences Between IRR and NPV, which is better

For this case, the IRR and NPV rules suggest different rankings. The IRR method suggested that renting the larger stand should have the highest priority whereas the NPV method suggested that building a new stand did.

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The reason for this relates to the timing of cash flows. The total cash inflow for building a new stand is greater than the option to rent a larger stand but because it occurs later, the IRR suggests that renting the larger stand is better.

When the discount rate is lower than approximately 18.2, the NPV for building a new stand is higher. When the discount rate is greater than approximately 18.2%, the NPV of renting a larger stand is higher. Since the discount rate is 15%, building a new both was prioritized higher. This is demonstrated in the plot below. The NPV method is better because it prioritized the option that generated the most cash flow as the highest. In the event that there were capital constraints, the IRR method may be more appropriate but that information was not presented in this case.

IV. Valu-Added Industries, Inc (VAI) Financial information as a result of investment in a Project. For part IV You are the CEO of Valu-Added Industries, Inc. (VAI). Your firm has 10,000 shares of common stock outstanding, and the current price of the stock is \$100 per share. You then discover an opportunity to invest in a new project that produces positive cash flows with a present value of \$210,000. Your total initial costs for investing and developing this project are only \$110,000. You will raise the necessary capital for this investment by issuing new equity. All potential purchasers of your common stock will be fully aware of the project's value and cost, and are willing to pay "fair value" for the new shares of VAI common.