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INVESTMENT DECISION ANALYSIS Case study: AAA Company

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INVESTMENT DECISION ANALYSIS

Case study: AAA Company

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Abstract

This assignment presents and hypothetical case regarding financial and investment decisions of the firm. Based on the critical analyses this paper work will identify the best possible project available for investment. The financial data presented on this assignment are done according to the information/data that has been provided, therefore analysing them in order to arrive to the best possible decision for investment.

In order to facilitate managerial decisions there has been presented necessary calculations. However, the evaluation and the importance of risk factors have been taken to concern. Furthermore, in order to accomplish this assignment, where on use various relevant books and journals. Therefore, this assignment will present academic and critical analysis.

By the end of this assignment, one can be able to understand financial analysis that company should take to concern, the activities has to follow by creative planning and forecasting the future plans in order to re-enforce the decisions on the investment that is about to be made.

Author (2006) states:

‘Investment gives to the investor always the benefits on gaining experience but not necessary gaining money, therefore investing gives the experience, and experience is something that money can’t buy, however the investors are investing in increase its wealth.

- therefore, the investment decision analysis is taking a great concern on return that the project it (may) returns, or gives an option to later return so current operation is to achieve the future benefits.’

Keywords: Investment decisions, financial forecasting and simulation, financial instruments.

JEL classification codes: G11, G17, G23.

1 Introduction

The 'AAA' Company is desirably planning to go on with investment in order to increase its production capacities. The investment is expected to have a lifetime of five years period. In regards to increase its production capacities, company had to make a choice between two alternative projects: plan 'X' and plan 'Y'.

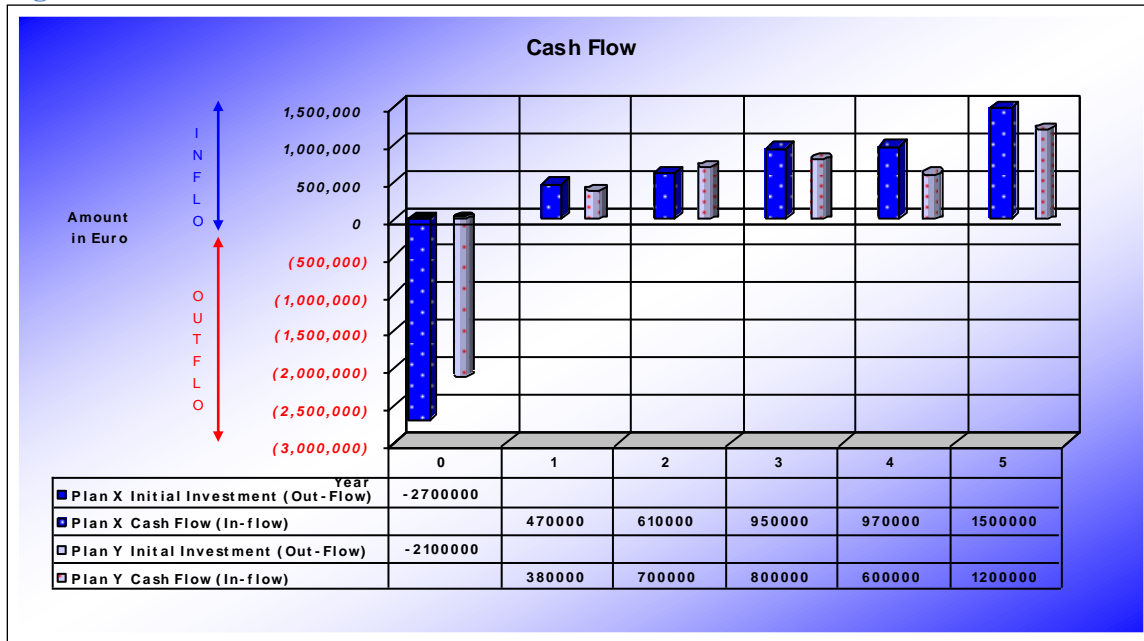
Base on the hypothetic data provided for AAA Company, two alternative projects X and Y the company will make its investment decisions. Furthermore, AAA Company will value it's to alternative projects based on the NPV, IRR and real option criteria, and will use all the data provided in order to bring the best possible perspective project.

This assignment will elaborate the investment that is about to be made for the AAA Company in these parts: The first part will present the techniques of the NPV and IRR by using the same discount rate. The second part will elaborate the investment with different risk profiles and will compare the results with first part by making the recommendations. The third part will focus on the real options and will compare findings from the part two. The fourth part will imply further recommendation if necessary by the effects of the capital rationing. Then fifth part, the last but not least will consider financing possibilities for the selected investment by elaborating pros and cons of financial instrument by taking in concern that company is not listed in any stock exchange.

2 The Project Cash Flow

One should know that 'Cash is the King' for any business, therefore the cash flow for two alternative investment have a similar trends. However, both plans are presenting one initial outflow and five projected inflows. Nevertheless, one can simply identify that Plan X have higher outflow and inflow compare Plan Y.

Figure 1 Cash Flow for Plan 'X' & 'Y'



Source: AAA Company (2020)

The above figure 1 presents the projected cash flows for both projects for five years period but there is no any discounting involved yet. Hence, if one calculates, the undiscounted cash flow for both projects can state; that plan X has higher investment with higher cash return. Nevertheless, the simple calculation on percentage shows that 22% lower investment has Plan Y compare to Plan X, but only 12% lower income in same comparison.

C = Cash; I = Investment (fixed cost); CF = Cash Inflow; t = time/year

$$C_t = CF_1 + CF_2 + \dots + CF_t - I$$

Plan X; $C = 470,000 + 610,000 + \dots + 1,500,000 - 2,700,000 = \mathbf{1,800,000}$

Plan Y; $C = 380,000 + 700,000 + \dots + 1,200,000 - 2,100,000 = \mathbf{1,580,000}$

3 Discounted Cash Flow Analysis

In order to understanding importance of discounting cash flow and its analysis, one should take to concern the main and basic step of time value of money where a “*dollar today is worth more than a dollar tomorrow* – because dollar today can be invested to start earning interest immediately” Allen, Bearly and Myers (2006). Furthermore, the discount analysis interprets projected future cash flows to equivalent present value.

The AAA Company would assume that both projects would have the same risk as the firm which is presented as discount of 12% of the cost of capital. The required techniques such as Net Present Value – NPV and Internal Rate of Return will be used to evaluate the acceptability of the projects.

3.1 Discounted Net Present Value

The AAA Company evaluates the Net Present Value for the investment that is planning to make on one of the projects 'X' and 'Y'.

The NPV of the projects is calculated such us:

C_0 = Initial Investment (Cash Outflow);

C_1 = Cash Inflow (numbers the inflow of that year/period)

r = Rate of return (cost of capital for project)

n = Years/periods

$$NPV = C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_n}{(1+r)^n}$$

The result presented below on the table 1 advocate NPV decision rule that results of both projects are accepted, since the NPV is greater than 0.

Table 1 Discounted Net Present Value at 12%

Cash Flow	Year	Plan X	Discounted at 12% Cost of Capital	Plan Y	Discounted at 12% Cost of Capital
Cash Outflow	0	(2,700,000 €)	(2,700,000 €)	(2,100,000 €)	(2,100,000 €)
Cash Inflow	1	470,000 €	419,643 €	380,000 €	339,286 €
Cash Inflow	2	610,000 €	486,288 €	700,000 €	558,036 €
Cash Inflow	3	950,000 €	676,191 €	800,000 €	569,424 €
Cash Inflow	4	970,000 €	616,453 €	600,000 €	381,311 €
Cash Inflow	5	1,500,000 €	851,140 €	1,200,000 €	680,912 €
Total CF/NPV		1,800,000 €	349,715 €	1,580,000 €	428,969 €

Source: AAA Company (2020)

Nevertheless, project cash flow shows that the project X generates larger amount of cash than project Y. The NPV at the discount rate of 12% indicate us that project Y has higher NPV at the end of five years compare to project X. Hence, the NPV of project X has a high initial investment and high returns/cash inflow on late years of its operation, where project Y has lower initial investment compare to project Y and slightly lower cash inflows in later years compare to project X. However, the NPV with annual discount rate of 12% provide the results that indicate AAA Company to accept project Y in comparison with project X.

3.2 Internal Rate of Return Decision Criteria

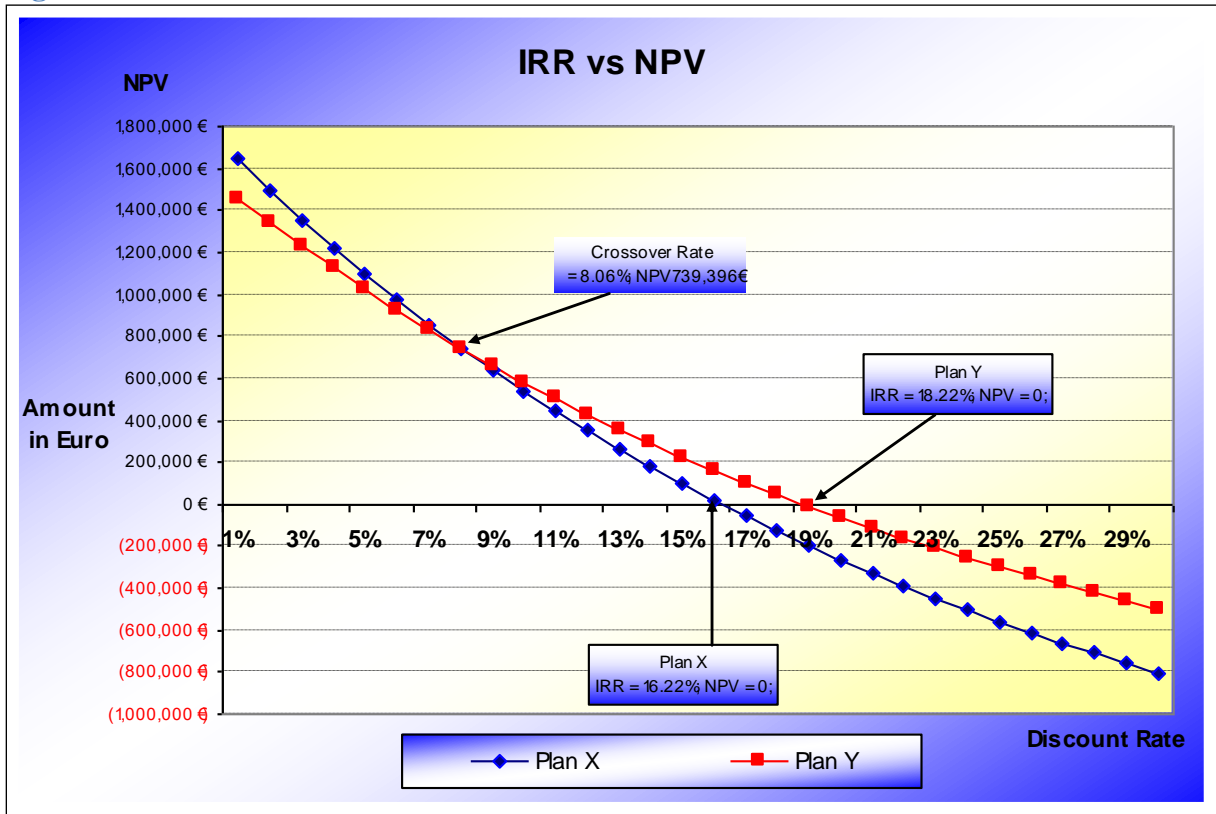
The intention of the Internal Rate of Return IRR is presenting the value of ' r '

$$r = \text{Rate of return (cost of capital for project)}$$

at which the project NPV = 0. Furthermore, IRR is a discount rate that arranges the project NPV to be equal to zero.

Looking at the below figure 2 both projects results of IRR are higher than cost of capital therefore both projects based on IRR rule could be accepted. Despite the result of NPV where Plan Y was more favourable, the IRR criteria shows that plan Y has 18.82% IRR, and plan X has 16.22% IRR. In the contest of IRR, criteria project X should rejected compare to the project Y.

Figure 2 IRR an NPV for Plan 'X' and 'Y'



Source: Author Calculation (2020)

Looking at the above figure 2 if the discount rate would be lower than crossover rate 8.06% the project X would be more favourable, but taking to the concern the cost of capital again the both projects would be unaccepted by IRR rule.

IRR Rule - Accept the plan if:

Internal Rate of Return \geq Cost of Capital

Projects would be unaccepted by IRR rule.

Based on the IRR results presented on the above figure 2 shows that project Y still remains favourable compare to project X.

4. NPV of plan X & Y using various risk adjusted discount rate

Looking at the below table 2 one can identify that after we used different risk adjusted discount rates NPV for both projects are still positive and accepted. However, project X should be accepted based on the high NPV result compare to project Y. Nevertheless, the NPV rules for the results show us that Project X is higher compare to the project Y; therefore, Project X should be accepted.

Table 2 NPV of Plan 'X' and 'Y' by using different risk adjusted discount rate

Cash Flow	Year	Plan X	Risk Adjusted Discount rate at 13%	Plan Y	Risk Adjusted Discount rate at 15%
Cash Outflow	0	(2,700,000 €)	(2,700,000 €)	(2,100,000 €)	(2,100,000 €)
Cash Inflow	1	470,000 €	415,929 €	380,000 €	330,435 €
Cash Inflow	2	610,000 €	477,719 €	700,000 €	529,301 €
Cash Inflow	3	950,000 €	658,398 €	800,000 €	526,013 €
Cash Inflow	4	970,000 €	594,919 €	600,000 €	343,052 €
Cash Inflow	5	1,500,000 €	814,140 €	1,200,000 €	596,612 €
Total CF/NPV		1,800,000 €	261,105 €	1,580,000 €	225,412 €

Source: AAA Company (2020) and Author tabulation (2020)

Comparing to early evaluation where both projects are having the same risk for both projects, the variable risk adjusted discount rate encourage project X to be more favourable compare to project Y, furthermore both projects are higher than cost of capital.

Hence, based on the NPV rules, project X is gives higher returns and should be accepted compare to project Y.

5 Real Options

Brealy, Marcus, et al, (1999) state that: “When a project is flexible or generates new opportunities for the firm, it is said to contain real options” (p.665). Therefore, in our assignment both projects are giving the opportunities to invest by giving a limited consideration of the real options.

Calculating the real option for the project X:

r_f = risk-free rate of interest = 9%

$$\text{Real Option} = \frac{\text{Net Present Value} * \text{Probability}}{(1 + r_f)^n}$$

$$\text{Plan X Real Option} = \frac{100,000 * 0.25}{(1 + 0.09)^3} = 19,305$$

Then, the real option for the project Y:

$$\text{Real Option} = \frac{\text{Net Present Value} * \text{Probability}}{(1 + r_f)^n}$$

$$\text{Plan Y Real Option} = \frac{500,000 * 0.20}{(1 + 0.09)^5} = 64,993$$

The increase in the amount that AAA Company can gain by placing this real options is shows to us that project Y is more favourable than Project X. Taking to the consideration the results presented for above on the table 2 where NPV of project X is higher than project Y, then after calculating the real option for both projects, and adding up to NPV the results of real option the project Y give us a better result compare to project X. Therefore, one can state that after explicit of the real of real option project Y is accepted and more valuable than project X.

6 Capital Rationing

A capital rationing / capital budgeting decision is equivalent as the budget constraint. White (2006) pointed out that: “capital rationing is a situation where a firm has only a limited amount of funds available for capital investment” (p.2). Therefore, the specific amount of money that company can invest may affect the investment decisions. Jones (2006) *Blue Book* stated that:

“in most cases firms face capital rationing restrictions since they only have a given amount of funds to invest in potential investment projects at any given time” (p. 9).

The AAA Company has to various investments and the outflow for project X is 2,700,000€ and for plan Y 2,100,000€, thereof if the company capital rationing is restricts by the amount of the funds of 2,100,000€ no matter if Plan X have a higher NPV capital rationing enforce the recommendation to change and limits the investment decisions to only project Y.

When companies are shortage of capital, and have many choices, they will use the profitability index (PI). By using, the values presented at above table 2 the calculation follows:

$$\mathbf{PI} = \frac{\mathbf{NPV}}{\mathbf{Investment}}$$

Plan X - PI = 0.10; where Plan Y - PI = 0.11;

Furthermore, the intention of the AAA Company is to invest in the highest NPV since is increasing their wealth, and then taking to concern the need of raising the wealth of the shareholders; it should use further techniques such as profitability index PI. However, the Profitability Index re-enforce the selected project Y as more attractive compare to project X:

7 Pros and Cons of Alternative Financial Instruments

Follow to our above presentation with regards to project investment that present positive NPV, at this stage we are going to discuss the possible alternative financial instrument that can face any company when is in need on raising money on order to invest. Nevertheless, as Allen at al (2006) pointed out that: “The firm can think, first, about the projects to accept and, second, about how they should be financed” (p.331).

In consideration that a company shares are not listed in any stock exchange, and the company is needed to raise the funds by using an alternative potential financial instruments such us:

Initial Public Offering, Bank, Corporate Bonds and last but not least the Leasing, where we will describe the pros and cons of each of this mention financial instruments.

7.1 Initial Public Offering IPO

Advantages of IPO:

- ⊕ Well know positive personality of chief executives of the company
- ⊕ Executive member to have large shares owned by them in order to secure the public, for the trust.
- ⊕ Less expensive and easily to be financed
- ⊕ Broaden ownership of investment
- ⊕ Large number of shareholders are present liquid shares
- ⊕ Monitored by outsiders/shareholders

Disadvantages of IPO:

- ⊕ Well know negative personality of chief executives of the company
- ⊕ Expensive since it takes time an energy
- ⊕ No one has full control based on its ownership
- ⊕ Competitors can have easy access over company strategy
- ⊕ IPO-this is lengthy procedures

7.2 Bank

Advantages of Bank:

- ⊕ Quick/short procedure to gain the dynamic found for investment
- ⊕ Business plan on black and white – paper.
- ⊕ Defined ownership
- ⊕ High returns for a shareholder
- ⊕ Focused ownership of investment
- ⊕ The strategy of the company is in-the-house, no access of it by competitors
- ⊕ Bank involvement on the investment, effect the share price tends to rise
- ⊕ Varity of loans offered by bank at the short and long term

Disadvantages of Bank:

- ⊕ Expensive since has high bank interest rate, as a fixed cost
- ⊕ Don't take the risk together with company, bank wants a collateral
- ⊕ High risk for investors
- ⊕ At the regularly monthly based - cash outflow
- ⊕ If the financial plan is not dynamic, is costly to the company
- ⊕ Hard to convince only by business plan.
- ⊕ Cost occurs on security for the loan

7.3 Corporate Bonds

Advantages of Corporate Bonds:

- ⊕ When includes a call option, a company has a flexibility to pay the debt early than planed
- ⊕ When interest rate falling, the company calls their bonds and replace them at the lower rate.
- ⊕ There is a risk by default in corporate bonds
- ⊕ Broaden ownership of investment

Disadvantages of Corporate Bonds:

- ⊕ Hard to predict bond fluctuation.
- ⊕ There is a risk by default in corporate bonds
- ⊕ A specified limit of issuing the debt
- ⊕ Limited by third party rules and regulation.
- ⊕ Investors are risk-averse not risk-lovers.
- ⊕ Cost occurs on security for the bonds

7.4 Leasing

Advantages of Leasing:

- ⊕ Flexibility that both parties can arrangements the payments towards the lessor, monthly, quarterly, semi-annually or yearly and not fixed rate.
- ⊕ After usage of the equipment's the lessee returns the goods to the lessor and is free of mind for reselling the equipment's.
- ⊕ Operating leases flexibility to close the contract at the option of the lessee
- ⊕ Leasing offers full financing

- ⊕ If company walk-out or restructure its business is obligatory to pay the next three years the payment and the deliver the asset to lessor.

Disadvantages of Leasing:

- ⊕ The long estimated economic life of the equipment's/assets if cancelled should be covered by lessee to reimbursed for any losses that occurred to lessor
- ⊕ Extra-unpredicted costs may occur if the asset is demolished by lessee and this are presented by the lessor.
- ⊕ During the lease the lessor in not applicable to make any changes at the assets without approval of the lessor.

AAA Company should define itself that if its needs to raise cash on low rate of interest and defined on lengthy procedures, the best possible financial instruments could be say is IPO, on another hand if needs quick at high interest rate Bank is the chosen for possible financial instrument, therefore as the mid option of procedures and mid interest rates could be stated the corporate bonds. The leasing has fast procedures and mid interest rates compare to others financial instruments.

8 Conclusions

This paper-work presents the main critical analysis in order to re-enforce the decisions in the company. The analysis applies to all criteria that affect the future cash flow. The evaluation of to alternative project has been made in order to raise the investor/company wealth by selecting the best positive Net Present Value of the project. Net Present value shows to the AAA Company the best project to be selected, moreover the same project was re-enforced by other criteria's which agrees with NPV rule.

Recognition of the real options data made the decision still more favourable, therefore by predicting the cash flow and real option value the company can benefit further into the future operation.

The limits of capital rationing, show to the company the boarders/limits of the necessary budget for investment. In this contest, whether the company is facing the limited funds to invest, there is presented the possibilities of other financial instrument to run the project. Alternative financial instruments are presented by elaboration of the pros and cons and the necessary one to be used.

9 Appendix

9.1 References

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9.2 Abbreviation

Abbreviations are listed in the alphabetical order:

- ✘ AAA - Name of the Company
- ✘ C - Cash
- ✘ CF - Cash Flow
- ✘ C0 - Initial Investment; (I)
- ✘ I - Initial Investment; (C0)
- ✘ IPO - Initial Public Offering
- ✘ IRR - Internal Rate of Return
- ✘ n - Years/Periods; (t) – Time/Year
- ✘ NPV - Net Present Value
- ✘ PI - Profitability Index
- ✘ r - Rate of return (Cost of Capital – Risk Adjusted Discounted Rate)
- ✘ r_f - Risk-free Rate
- ✘ t - Time/Year; (n) – Years/Periods
- ✘ X - Project Name X
- ✘ Y - Project Name Y