The importance of investment appraisal

ASSIGN BUSTER

Investment appraisal helps the investors or the financial institutes to identify the attractiveness of any investment proposal among different available methods, for instance IRR (Internal Rate of Return), NPV (Net Present Value), Payback period etc. Investment Appraisal is a fundamental body of Capital Budgeting which is also applicable in the areas where the return may not be quantifiable. Investment Appraisal is important as because it shows the investors to calculate the outcome of the investment. Furthermore, with the help of Investment Appraisal the investors can easily identify the best or most profitable option among the available alternatives. (Investment Appraisal, [n. d.]).

(b) What is the payback period of each project? If AP Ltd imposes a 3 year maximum payback period which of these projects should be accepted?

The payback period is the time frame required to recover the invested amount. In the case of the cash flows with an annuity (same amount in each year), then payback period can be easily calculated by dividing the cost by the annual cash flow. Otherwise we subtract the cash flows from the cost until the remainder is zero. For any sort of investment firms prefer short payback period as the investment can be used somewhere else. Generally, firms maintain some maximum allowable payback period against which all investments are compared. It is a popular method as is quick and easy to calculate and importantly it gives a measure of the liquidity of the project. (Timothy R. Mayes, [n. d.])

Payback Period for Project A:

Year

Cash Flow

Cumulative Cash Flow

1

38

38

2

42

80

3

48

128

4

50

178

5

70

248

The payback period for Project A= 2+ (115000-80000)/48000= 2+ 0. 73= 2. 73 years

Payback Period for Project B:

As this is a constant stream of cash flow, the payback period for Project B

= 115000/43000= 2. 67 years

Both the projects can be accepted, If AP Ltd imposes a 3 year maximum payback. But between these two projects, B will be preferred over A.

(c) What are the problems of the payback period?

Though the payback method provides real usefulness by providing information on how long funds will be engaged in the project it suffers from two primary problems:

Payback Period does not consider the time value of money: In this calculation, Cash Flows are simply added without discounting. This violates the most basic principle of financial analysis which stipulates that cash flows occurring at different points can be considered only after suitable compounding/ discounting. (V S RAMA RAO, 2008)

This measure does not consider a project’s profitability. It is just a measure of a project’s capital recovery.

Though it measures a project’s liquidity, it does not indicate the liquidity position of the firm as a whole. (V S RAMA RAO, 2008)

The payback period method leads to ignore projects generating substantial cash inflows in later years. (Sarma, Deepak, nd)

(d) Determine the NPV for each of these projects? Should they be accepted – explain why?

Project A:

Year

Cash Flow

Discount Factor

Net Present Value

1

38000

0. 896860987

34080. 72

2

42000

0. 804359629

33783. 10

3

48000

0. 721398771

34627. 14

4

50000

0. 646994413

32349. 72

5

70000

0. 580264048

40618. 48

Total

175459. 16

So, Profit = Total Inflow- Initial Investment

= 175, 459. 16-115, 000. 00

= 60459. 17

As the NPV of Project A seems a profitable one (Project’s NPV is bigger than the Initial Investment) it can be accepted.

Project B:

Year

Cash Flow

Discount Factor

Net Present Value

1

43000

0. 896860987

38565. 02

2

43000

0. 804359629

34587. 46

3

43000

0. 721398771

31020. 14

4

43000

0. 646994413

27820. 75

5

43000

0. 580264048

24951. 35

Total

156944. 74

So, Profit = Total Inflow- Initial Investment

= 156944. 74- 115000

= 41944. 74

As the NPV of Project B seems a profitable one (Project’s NPV is bigger than the Initial Investment), it can be accepted.

(e) Describe the logic behind the NPV approach.

The net present value (NPV) is the difference between the present value of the cash flows (the benefit) and the cost of the investment (IO):

In other words, this is the projected increase in wealth that the shareholders will receive out of any accepted project. All projects with NPV greater than or equal to zero should be accepted. A project with positive Net Present Value means the IRR is greater than the Weighted Average Cost of Capital (WACC).

NPV, Net Present Value, allows you to value a company’s assets at their correct current value when the accounts are prepared. The calculation of

NPV takes into account the assets original cost, less all accumulated depreciation allowed against that asset in previous tax computations.

“ The NPV method is based on a logical approach. An NPV of zero signifies that the project’s cash flows are exactly sufficient to repay the invested capital and to provide the required rate of return on that capital.” If NPV > 0, then the project is generating a larger amount of cash that required to service debt and to allow a return to shareholders. So if the firm takes on projects that have positive net present values (NPV) then the wealth of shareholders will increase, enticing them to increase their investment in the firm”.

The NPV method of capital budgeting dictates that all independent projects that have positive NPV should accepted. The rationale that is behind that assertion arises from the idea that all such projects add wealth, and that should be the overall goal of the manager in all respects. If strictly using the NPV method to evaluate two mutually exclusive projects, you would want to accept the project that adds the most value (i. e. the project with the higher NPV).

“ Net present value is defined as a way to improve the effectiveness of project evaluations through the use of discounted cash flow techniques. To find the present value of a project, you must first find the present value of each cash flow discounted at the cost of capital. Then, sum the discounted cash flows. If the NPV is positive, accept the project. If NPV is negative, reject the project. It is important to remember that if two projects are mutually exclusive, the project that has the higher NPV should be selected”.

Net present value is defined as a way to improve the effectiveness of project evaluations through the use of discounted cash flow techniques. To find the present value of a project, you must first find the present value of each cash flow discounted at the cost of capital. Then, sum the discounted cash flows. If the NPV is positive, accept the project. If NPV is negative, reject the project. It is important to remember that if two projects are mutually exclusive, the project that has the higher NPV should be selected”

(f) Discuss the relationship between NPV and cost of capital.

NPV has a direct impact on the capital budgeting decision. These two factors are directly inter-related.

NPV < 0 implies IRR < Cost of Capital: At this stage the company reject the investment from the cash flow perspective. Apart from that the company needs to consider other factors as well.

NPV = 0 implies IRR = Cost of Capital: Provides the minimum return. Probably reject from the cash flow perspective. Others factors could be important.

NPV > 0 implies IRR > Cost of Capital: Screen in for further analysis. Other investments may provide better returns and capital should be rationed, i. e., go to the most profitable projects. Others factors could be important.

(g) Calculate the IRR for each project. Should they be accepted?

IRR of Project A:

NPV at 25%

Year

Cash Flow

Discount Factor

NPV

1

38

0. 8

30. 4

2

42

0. 64

26. 88

3

48

0. 512

24. 576

4

50

0. 4096

20. 48

5

70

0. 32768

22. 9376

Total

125. 2736

Initial Investment

115. 0000

Net Present Value at 25%

10. 2736

NPV at 30%

Year

Cash Flow

Discount Factor

NPV

1

38

0. 769230769

29. 23077

2

42

0. 591715976

24. 85207

3

48

0. 455166136

21. 84797

4

50

0. 350127797

17. 50639

5

70

0. 269329074

18. 85304

Total

112. 2902

Initial Investment

115

Net Present Value at 30%

-2. 70976

So, IRR For Project A = 25%+ {10. 2736/(10. 2736+2. 7097)} x (30%-25%)

= 25%+3. 95%

= 28. 95%

As the IRR of Project A is a positive one, it can be accepted, considering the remaining factors constant.

IRR of Project B:

Net Present Value at 25%:

Year

CashFlow

Discount Factor

NPV

1

43

0. 8

34. 4

2

43

0. 64

27. 52

3

43

0. 512

22. 016

4

43

0. 4096

17. 6128

5

43

0. 32768

14. 09024

Total

115. 639

Initial Investment

115

Net Present Value at 25%

0. 63904

Year

CashFlow

Discount Factor

NPV

1

43

0. 769230769

33. 07692

2

43

0. 591715976

25. 44379

3

43

0. 455166136

19. 57214

4

43

0. 350127797

15. 0555

5

43

0. 269329074

11. 58115

Total

104. 7295

Initial Investment

115

Net Present Value at 30%

-10. 2705

So, IRR For Project A = 25%+ {6390/(6390+102705)} x (30%-25%)

= 25% +0. 29%

= 25. 29%

As the IRR of Project B is a positive one, it can be accepted, considering the remaining factors constant.

(h) How does a change in the cost of capital affect the project's IRR?

" The internal rate of return (IRR) is considered as the discount rate that nullify the present value of a particular project's projected cash inflows to the present value of the projects cost (interest rate) or equivalently, the IRR is the rate that forces the NPV to equal zero"

The discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. Generally speaking, the higher a project's internal rate of return, the more desirable it is to undertake the project. As such, IRR can be used to rank several prospective projects a firm is considering. Assuming all other factors are

equal among the various projects, the project with the highest IRR would probably be considered the best and undertaken first.

The logic behind the IRR method is:

The IRR on a project is its measured rate of return. If the internal rate of return exceeds the cost of the funds used to finance the project, a surplus will remain after paying for the capital, and this surplus will accrue to the firm’s stockholders

Therefore, taking on a project who’s IRR exceeds its cost of capital increases shareholders’ wealth. On the other hand, if the IRR is less than the cost of capital, then taking on the project will impose a cost on current stockholders. It is this “ breakeven” characteristic that makes the IRR useful in evaluating capital projects.”

(i) Discuss why the NPV method is often regarded to be superior to the IRR method?

The IRR is defined as the discount rate that equates the present values of a project’s expected cash inflows to the present value of the project’s costs” (Page 351). Additionally, “ when dealing with independent projects, the NPV and IRR methods will always yield the same accept/reject result. ‘ However, in the case of mutually exclusive projects, NPV and IRR can give conflicting results. One shortcoming of the internal rate of return is that it assumes that cash flows received are reinvested at the project’s internal rate of return, which is not usually true

A conflict exists if the cost of capital is less than the crossover rate. Two basic conditions can cause NPV profiles to cross, and thus conflicts to arise between NPV and IRR:

(1) when project size (or scale) differences exist, meaning that the cost of one project is largest than that of the other, or

(2) when timing differences exist, meaning that the timing of cash flows from the two projects differs such that most of the cash flows from one project come in the early years while most of the cash flows from the other project come in the later years (Page 355)

The value of early cash flows depends on the return we can earn on those cash flows, that is the rate at which we can reinvest them. “ The NPV method implicitly assumes that the rate at which cash flows can be reinvested is the cost of capital, whereas the IRR method assumes that the firm can reinvest at the IRR” (Page 355). Because of the above criteria The NPV method is considered as more reliable method than IRR. The best assumption is that the projects’ cash flows can be reinvested at the cost of capital (Page 355).

The IRR is a popular technique primarily because it is a percentage which is easily compared to the WACC. However, it suffers from a couple of flaws:

The calculation of the IRR implicitly assumes that the cash flows are reinvested at the IRR. This may not always be realistic.

Percentages can be misleading (would you rather earn 100% on a $100 investment, or 10% on a $10, 000 investment?)

Using both measures gives better results than using either alone. IRR is also useful alone in virtually all time-value-of-money problems.