

# Compare the discounted cash flow with the internal rate of return and the different uses of the company

Yufan Liu

Shanghai Jiao Tong University SJTU continuing education A-LEVEL Centre, China

**Keywords:** discounted cash flow, internal rate of return, a formula to calculate, range of application.

**Abstract:** This article mainly compares the difference between discount rate and internal rate of return, from the comparison of variables to actual corporate decision. The advantages and disadvantages of each method are analyzed, and the different methods selected for individual problems are also referenced

## 1. The advantages and disadvantages of the two measurement methods

### 1.1. Discounted Cash Flow

It defined as the reduce the expect cash flow of the enterprise for a specific period in the future to the present value.

Basic formula:

$$\sum_{t=1}^n \frac{CF_t}{(1+r)^t}$$

P-the assessed value of the enterprise

N-time span of the asset

CF<sub>t</sub>: the cash flow at period of t

r :discounted rate

The discounted cash flow is based on the variables cash flow and discount rate, so the evaluator needs to evaluate the cash flow in the future period.

The first merit of this method is it is theoretically the most perfect method, because during the calculation, the risk of the capital and the condition of the firm, and also the time value during a period of time.

Second, it does not suffer from short run strategies, because of its long period, some alternative solutions in shord term will not lead to huge difference in discounted cash flow.

Third, this method depends on the company's future development strategy. The establishment of different variables in the future requires the company's future business strategy. Therefore, this calculation method can also reflect the company's business strategy.

However, the discounted cash flow method still has some deficiencies. The measurement could be inaccurate because it depends on the expectations, With this method, the correctness of the results depends entirely on the correctness of the assumptions used. If the future cash flow of the enterprise is very unstable, the discounted cash flow method is powerless

Second, the calculation is very complex, and many assumptions require repeated reference and comparison of data from different periods, but accurate data is often not available .

Finally, it lacks flexibility. In the future, every change in strategy and decision of the company will change the assumed result of this method, so the operation of the company is not intelligent .

Discounted cash flow can be used to evaluate the value of assets,the value of enterprises and the feasibility of project investment, When the net present value, the amount of cash inflow after the investment project is put into use, is discounted as the present value according to the capital cost rate or the necessary investment revenge rate to be achieved by the enterprise, and the balance after

deducting the initial investment is greater than or equal to 0, it indicates that the benefit exceeds the capital cost rate of the company's investment, indicating that the project is feasible. The discount rate is the rate of return reflecting the time value of money and the underlying risk in the current market, The discount rate used in asset valuation is usually determined after risk adjustment according to the risk-free rate of return matching the asset life. In the enterprise valuation, the weighted average cost of capital of equity capital and debt capital is used as the basis to determine the discount rate.

### 1.2. Internal Rate of Return (IRR)

Internal rate of return, the discount rate when net present value is equal to zero, or, when the total inflow and outflow of net present value is the same.

$$\sum_{t=0}^n \frac{NCF_t}{(1+i)^t}$$

NCF<sub>t</sub>: in year t, the value of net cash flow

i: when NPV=0, the discount rate, i=IRR

t: the number of the year

n: Project estimated years

The advantage is the ability to relate the return over the life of the project to the total investment, identify the rate of return of the project, and compare with the other projects directly.

Second, the company can obtain the highest expectation of investment through IRR calculation, which can be used as the highest limit of borrowing rate if the amount of loan is uncertain.

However, IRR is shown in percentage, so there could be misleading because of low rate. But the low rate could also be caused by large-scale NPV, Therefore, in the selection, these two data should be considered together.

IRR is greater than the minimum return on investment or cost of capital required by the company, and the plan is feasible; IRR is less than the minimum return on investment required by the company, so the plan is not feasible. If it is a comparative choice of multiple mutually exclusive plans, the higher the internal rate of return, the better the investment benefit. The advantage of the internal rate of return method is that it considers the real rate of return and the time value of capital. The disadvantage is that the calculation process is complicated and tedious.

In the calculation of internal rate of return (IRR), it refers to the discount rate when the cumulative net present value flow of an investment scheme is 0 during its lifetime. If the IRR is higher than the company's cost of capital rate, the project is viable

At present, stock, fund, gold, real estate, infrastructure, futures and other investment methods have been familiar with and used by many financial managers. However, many people's understanding of the effect of investment. In the calculation, the net present value approaching zero is obtained by adjusting the discount rate, and then the internal rate of return is obtained by linear interpolation method according to the discount rate of two adjacent positive and negative net present values approaching zero

### 1.3. Suitable circumstances of using these two methods

When it comes to projects with high risks, it is inevitable to underestimate the benchmark discount rate and overestimate the net present value in this way, which leads to wrong investment decisions of enterprises. The risk of different projects is different, the cost of capital and the required rate of return is naturally not the same, the level of return required for project investment is determined according to the project risk rather than the risk of the company, so the benchmark discount rate of each project should be different; However, a surprising number of companies use corporate risk rather than project risk when evaluating new investments . /1/

In the usage of IRR, both NPV and discount rate should be considered in decisions making. Except that many companies misjudge project risk versus corporate risk. At the same time, excessive risks

will also mislead the company's decision-making and ultimately lead to the company's failure to achieve expected profits or even losses. Therefore, the internal rate of return and net present value must be considered in the selection of each scheme. Internal rate of return (IRR) is the expected rate of return on an investment. It is the discount rate that can make the net present value of the investment project equal to zero

However, the NPV of these higher risk projects might be overstated, so with the reference of IRR, the profit might also worsen in the long term.

In the usage of DCF. And unstable cash flow of a company in the future may not lead to an expected result.

Therefore, the application of the discounted cash flow method in the strong and stable cash flow industry combined with the future discount rate will play a more accurate valuation. For example, for the sales of some essential products, the project and future estimation of this industry is likely to be reasonable and accurate.

As the uncertainty of enterprise operation exists objectively, it is very important to judge the risk of enterprise's future earnings. When the risk of enterprise's future earnings is high, the discount rate should be high; when the risk of future earnings is low, the discount rate should be low. Take the stock market as an example. This does mean that discounted cash flow is of great value. First of all, the worst-case and best-case scenarios are considered in the valuation, so the boundary of the extreme valuation can be given, and this boundary can be used as the basis for investment decisions.

## 2. Conclusion

The internal rate of return is a ratio that measures the profitability of an investment. It is also easy for policymakers to understand. By comparing the internal rate of return to the required rate of return, users can easily decide whether to invest in a project or not. The IRR needs to take into account the time value of money. In addition, it can be directly compared with other rates such as inflation rate, interest rate, etc. Although IRR has many advantages, it also has some disadvantages. The first is that it cannot accurately measure how much profit a project can generate. Second, when the direction of cash flow changes greatly, there may be more than one IRR, which makes projects difficult to evaluate. In this case, the direction of cash flow changes only once. In addition, the IRR is easy for the sales director to understand. Finally, it considers the time value of money. /2/

The discount rate plays a key role in the calculation, so once the discount rate is slightly different from the correct discount rate, the difference between true present value and false net present value can be quite large. Moreover, it is difficult to choose the right discount rate. On the other hand, the NPV advantage is attractive to professionals. It can reflect the accurate present value of future investment profits. Furthermore, it not only shows the value of the cash flow, but also considers the risk of the project in the first place, which makes it possible to compare projects at different risk levels. /3/

Generally speaking, the advantage of internal rate of return (IRR) is that it can directly reflect the actual income level of investment projects from a dynamic perspective and is therefore more relevant and direct considerations of investors. The disadvantage is that after a large amount of additional investment, may lead to multiple IRR, or high or low, lack of practical significance, As the discount rate increases, NPV initially rises and then declines. The

reason for this is the double change in the sign of the cash-flow stream. Whenever the cash-flow stream is expected to change sign more than once, the company typically sees more than one IRR.

As if this is not difficult enough, there are also cases in which no internal rate of return exists. There can be as many internal rates of return for a project as there are changes in the sign of the cash flows. Only those with an IRR that is large or equal to the cost of capital are viable, and both need to be cross-referenced when making decisions

But at the same time, there may be conflicts when calculating the discounted cash flow and comparing the internal rate of return. These conflicts may result from the difference of initial

investment capital, the size and time of cash flow and the different life of the project, which will lead to the deviation of calculation.

### **References**

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