NPV Analysis and Applications for Competitive Intelligence

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Within the broad category of finance, there are many tools and techniques available for use by competitive intelligence (CI) professionals to analyze the general financial health of a company and its competitors. Whether your firm or your client might be considering such things as mergers & acquisitions (M&A) analysis or project valuation, net present value (NPV) analysis is a very simple tool that can be used with great benefits.

WHAT IS NPV ANALYSIS?

The net present value of an investment is:

- the value an investment must represent today
- on a discounted cash-flow basis
- to make an investment worthwhile after taking into account the cost of the investment

Discounted cash flow numbers are arrived at by estimating the cash flows in your future scenario, and adjusting them to a value they represent today based on some predefined discount rate. The NPV is the sum of the discounted cash flows minus the cost of the investment. If the NPV is positive, the investment is worth taking on because it is essentially the same as receiving a cash payment equal to the NPV. Conversely, if the NPV is negative, taking on the investment dilutes the firm's value and should be rejected. But first, let's discuss how to arrive at appropriate discount rates and calculate a firm's Weighted Average Cost of Capital (WACC).

WHAT IS THE APPROPRIATE DISCOUNT RATE?

The choice of discount rate to use in your NPV analysis can have serious impact on results and there are several different ways to arrive at an appropriate discount rate. As a general rule, you should use a discount rate that matches the way in which your firm is financed.

If a firm were entirely financed with equity, the most appropriate discount rate to use would be the required return to equity required by shareholders. A more realistic notion is that the firm in question is financed with some allocation of debt and equity, in which case using the firm's WACC is most appropriate.

WEIGHTED AVERAGE COST OF CAPITAL

You can calculate the WACC if you have the firm's equity and debt market values, the cost of equity, the cost of debt, and the firm's corporate tax rate. If your competitors are public companies, this information is in their public financial statements. If your competitors are private companies, (as is often the case), finding these figures often requires primary research.

Suppose your firm has a market value of $1 billion and is currently operating at its target debt/equity ratio of 33.3%. These values indicate total debt of $250 million and total equity of $750 million. Continuing further, suppose that the firm's cost of debt is 12% and the required return to equity shareholders, which can be calculated in several different ways, is 15%. Finally, the firm has a corporate tax rate of 34%. The WACC returned to us in this calculation is 13.23%. (See Table 1.)

TABLE 1: WEIGHTED AVERAGE COST OF CAPITAL

Financing	Mkt. Value (millions)	Weight	Cost of Capital (After tax deductibility on bonds)	WACC
Debt	$ 250	25.0%	12% x (1-0.34)	1.98%
Equity	750	75.0%	15%	11.25%
	$ 1,000	100.0%		13.23%

HOW IS NPV CALCULATED?

The NPV is the sum of the discounted future cash flows less the cost of undertaking the project. For example, if Firm A wants to acquire Firm B for $50 million and expects Firm B to produce cash flows of 15,000,000, 20,000,000, and 27,500,000 at the end of each of the next three years, the NPV of the investment in Firm B would be $826,447 (using a discount rate of 10%). (See Table 2.)

To discount the future cash flows, simply take the expected cash flow divided by [(1+discount rate)^time period]. For example, in period 3, the $27.5 million cash flow is discounted by taking 27,500,000/[(1+10%)^3].

NPV IN AN M&A SCENARIO

The use of NPV analysis is probably most straightforward in an M&A scenario due to the difficulty

TABLE 2: NET PRESENT VALUE

Cash Inflows		15,000,000	20,000,000	27,500,000
Year	0	1	2	3
Cash Outflows	(50,000,000)			
Discount Cash Flows	(50,000,000)	13,636,364	16,528,926	20,661,157
Net Present Value (NPV):	826,447			
Discount Rate (I):	10.0%			

inherent in projecting cash flows in a project scenario. Within M&A, you need only know the value of both the acquirer and firm being acquired, along with any synergies expected from the merger.

As a brief example, consider market values of Firm A and B of $400 million and $200 million, respectively (both firms are financed entirely with equity). The market believes the combined firm will have a market value of $750 million post-merger, indicating synergies between the two firms of $150 million. Firm B's board of directors will merge with Firm A only if given $275 million in cash, or a $75 million premium to its current market value. The NPV of this scenario to Firm A's shareholders is $75 million ($750-400-275).

In this example, the value placed on the synergies between the two firms is critical. Synergies generally present themselves through revenue enhancement, cost reduction, lower taxes, and a lower cost of capital within the combined firm. The synergy value is the sum of the discounted cash flows, expected in the predictable future, resulting from these activities.

NPV IN A PROJECT VALUATION SCENARIO

When firms commit to a project, they often have several project options available to them. Some of these projects are alternatives to each other, while others are mutually exclusive. NPV analysis can be used to determine which project(s) to invest in given a set CAPEX (capital expenditures) budget.

Consider an example within a manufacturing environment where a firm must either upgrade a machine or purchase a new machine to satisfy expected production needs for a new product. Table 3 indicates the firm's alternatives, including the expected flows (note that I am using the 13.23% WACC calculated above as the discount rate).

The firm anticipates they will experience cost reductions of 100,000 in each of the next three years if they upgrade, versus annual cost reductions of 125,000 if they purchase the new machine. While the new machine allows the firm to book greater annual revenues in the coming years than if they upgrade the existing machine, the new machine's $2.0 million cost results in the negative NPV as shown. In this scenario, it is clear that the firm should upgrade the existing machine, adding value to the tune of $43,809 within the firm. (See Table 3).

CI APPLICATIONS

Now that you have the background of how NPV is calculated and a few examples of using this tool, how do we apply it within a CI function? We know that if given the right information about an M&A or project scenario, calculating the NPV and analyzing this information is relatively straightforward. CI professionals without a strong financial background can use this information to arrive at probabilities of certain projects and company initiatives being sought.

Knowing the cost of a project and the estimated cash flows, along with the firm's financial information described above, the CI department can attempt to predict which acquisitions or

TABLE 3: NPV IN A PROJECT VALUATIONS SCENARIO

Option A: Upgrade Existing Machine

Year	**0**	**1**	**2**	**3**
Cost:	(1,000,000)			
Expected Flows - Revenue Increase		275,000	350,000	425,000
Expected Flows - Cost Reduction		100,000	100,000	100,000
Total Expected Cash Flows	(1,000,000)	375,000	450,000	525,000
Discounted Flows	(1,000,000)	331,184	350,986	361,639
NPV	43,809			

Option B: Purchase New Machine

Time Period	**0**	**1**	**2**	**3**
Cost:	(2,000,000)			
Expected Flows - Revenue Increase		500,000	625,000	750,000
Expected Flows - Cost Reduction		125,000	125,000	125,000
After-tax Salvage Value - Old Mach.	132,000			
Total Expected Cash Flows	(1,868,000)	625,000	750,000	875,000
Discounted Flows	(1,868,000)	551,974	584,976	602,731
NPV	(128,319)			

investments their competition will engage in near-term. Using the CI function's resources to obtain the information, coupled with the decision rules used within NPV analysis, will allow a company to make important strategic and tactical decisions with their investment dollars.

When engaging in financial competitive intelligence, there are many tools CI professionals can use to add value to their processes. NPV analysis is more appropriate in some situations than others, as is the case with all business and financial metrics. I strongly believe that the use of this tool, combined with other financial tools such as financial statement analysis, can quickly indicate whether further due diligence into a specific M&A or project valuation scenario, for example, is worth your time.

I recommend incorporating NPV analysis into your early qualifying criterion within most financial measurement scenarios. While I used M&A and Project Valuation as my examples, NPV analysis can also play valuable roles within lease-or-buy decisions, capital budgeting, and stock or bond investment alternatives.

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