

beyond... the mbh newsletter



May 2002

Editors Comment

Frequent readers of this newsletter will be well aware of our feelings relating to Net Present Value and its use as a project selection method. You also will have noted the frequent quoting from Gartner and from MIS Magazine. This magazine is read with great love around MBH offices. It is therefore a heavy heart that writes this newsletter. MIS magazine have proven that business understanding of NPV and its use is so poor that it is surprising there isn't HIH and One.Tel disasters happening on a daily basis. Our guess is that the totally inadequate capital controls that businesses employ probably mean that they miss out on opportunities rather than make bad ones that might cause the business to go under. With all this in mind, MBH has once again taken up the cause of being champion for NPV.

This newsletter will quote from the May issue of MIS magazine and highlight the misunderstandings of NPV and other financial measures that took place. It will once again explain why each point is in error and how NPV along with option pricing on real assets are the only methodologies that matter when it comes to project selection.

Those awaiting our long promised issue on Program Management will have to wait another issue and read about our thoughts on this evolving theory and its practical application in June.

Oh why do you abuse me so? NPV's Ode to MIS magazine.

NPV stands for Net Present Value. The word "NET" implies that something has been subtracted from something else. Everyone identifies the rather useless measure of net profit as being revenue minus expenditure. So what is subtracted from what to obtain NPV.

The present value of the future cash outflows created by an investment is subtracted from the present value of the future cash inflows created by an investment.

It is logical that if an investment is going to take out of a company more cash than it brings back in then there can be no possible good in making such an investment. Yes, even if the investment is for the social good, as this should be taken into consideration in forecasting the cash flows. Dumping chemicals into a river may save costs in the short term but it will cost the company more in the long term. It is a hard sell if consumers are no longer living to purchase the end product.

The initial dumping exercise only has a positive NPV if you assume the company is not going to be a going concern in the future. However, if you remove the going concern rating from a company then up go its borrowing costs, down goes its share price (as there will be no residual value applied to the company's future cash flows) and bingo, the project actually has a huge negative NPV.

The components of an NPV are the following:

- Forecast of future cash outflows created by the project, including the initial costs as per above,
- Forecast of future cash inflows created by the project, including incidental benefits and
- The discount rate to be applied

The only one of these three we haven't talked about is the discount rate. The starting point for a discount rate is the Weighted Average Cost of Capital (WACC).

The WACC is a discount rate calculated based on the level of debt and equity a company has, the required return on debt and equity, and the tax rate. WACC is only validly applied to an investment decision if the project is of a similar risk profile as the existing business and if the debt-to-equity ratios are going to be the same after the project as before it. If the WACC will go up after the project is implemented, then a higher risk rating should be applied to the project. This is known as a risk adjusted discount rate. The beautiful thing about the risk-adjusted discount rate is that it takes risk into account when determining if a project should go ahead.

When used internally, the discount rate applied should be even more accurate than when used externally by analysts. This is because one of the things completed to calculate WACC is calculating the required return on equity. The required return on equity is calculated using the Capital Asset Pricing Model (CAPM). One of the flaws with this model is it assumes that the market has all relevant information at hand. This is obviously not true when talking about external analysts knowledge of another business, but surely this is true when talking about internal management's knowledge of its own business. With this knowledge, management should be able to determine appropriate risk adjusted discount rates and thereby calculate valid NPV's.

We now have explained the three components for calculating the NPV of a project. Once these components have been estimated, they are stuck into a very simple formula and voila, you have an NPV result.

Mathematically, this is very simple. Obviously, what is being completed has a certain level of volatility to it. Forecasting is never accurate and is often far from it. This is why sensitivity analysis, Monte Carlo simulation and option pricing should also be completed when assessing the validity of the NPV number and the possibility of follow on options being greater than the initial negative NPV. It is this last point that is the fundamental new concept that must be added to firm's capital budgeting processes to ensure the project selection is both robust and valid.

Before we cover why, we need to take a step back and look at exactly what are we trying to achieve in the first place.

Every measure of a company's value (or any other assets value like gold, oil, internal company spend on IT and on HR etc) is static at a moment in. It can be re-measured but once again, this is only a static point in time and no matter how hard one tries, you can never get a measure that will take into effect the fact that it is static and time is not. Therefore, companies develop qualitative methods to provide goals and clarity around how it should transact its business. At a high level, this qualitative factor is known as business strategy. Business strategy outlines what a company will look like in the long term and how it will go about achieving that look. Measures are developed to give it static checkpoints as it progresses towards achieving its goals. Yet the vision that all the measures are built around is completely qualitative and is made up of senior executives decisions based on the static measures they have during the strategic planning sessions. The strategy that is developed is senior management's belief in what will differentiate it from its competitors.

Companies need to differentiate themselves to generate competitive advantage. Competitive advantage is extremely transient (unless you are part of a cartel or have a monopoly) and therefore the things that create competitive advantages today will change tomorrow. This brings about the need for businesses to continually re-think and track their strategy.

In this sense, competitive advantage = strategic value. Strategic value is a monetary value. As most organisations aim is to increase shareholder value, strategic value = shareholder value. If senior executives after completing their strategic planning sessions then forecasted the future operating cash flows of the business that they believe will occur because of the strategic plan, then calculated the future cost of investments to achieve this operating cash flow, discounted the net values by the company WACC and divided this number by the current number of shares outstanding in the business, they would then have their view of what the share price should be. This is exactly the same as what NPV does, except it does it for one investment only rather than all investments. By doing it for one investment only, it ignores the options that an investment creates and thereby ignores the value of those options. In short it only partly values the competitive advantage created.

It is this factor that causes some managers to say a project must go ahead "because it is strategic". It is also the reason why you need option pricing to calculate the value of the options created by the investment. Once the option value has been calculated and added to the initial NPV, you have a complete measure of the expected strategic value of a project. There is no other measure that will value the competitive advantage a project creates other than NPV and option pricing. They are the only valid measures of whether a project should exist or not and like all measures should be completed and checkpoints throughout an investment's life to see if they are still valid.

With this very short explanation of NPV and option pricing, we return to our article in MIS magazine.

The first thing that needs to be addressed has nothing to do with NPV and ROI and that is the article's focus on using the term "IT Projects". There is no such thing as an IT project and calling a project an IT project is the first step towards ensuring the project fails.

Projects are cross-functional and are therefore business projects not IT projects or Marketing projects or Operations Projects. In fact, nearly all projects that are implemented in business today have some element of IT in them. It is a capital mistake however, to look at the solution one is implementing as an IT solution. People are what drives a business and the cultural and change management issues of business project management significantly outweigh the technical issues of programming delay and systems integration. Functionality that matches a user's needs, users take up of the technology, business understanding of the new processes and belief in whatever new world has been created are far more difficult to obtain within budget and with resulting business benefit than the IT related issues.

Now to the article itself.

The first quote that needs to be addressed is the following "NPV has inherent problems. First, the risk of projects is assumed to be equal among competing investments". As per above the discount rate (ie: the measure of risk) should be increased for riskier projects and decreased for projects that reduce a company's "riskiness".

Classic examples of where adjusting discount rates up would have saved companies billions are in e-business. E-Business created a whole new channel of distribution for companies. It could hardly be seen as a project that was of similar nature to the existing business, whatever form the e-business project took. It had and has huge risks involved in it and therefore needs to be assessed with a higher discount rate.

An example of where a discount rate should be reduced is in BCP projects. The establishment of disaster recovery plans, crisis management plans etc is justified on the basis

of reduced risk. These plans when communicated to the market are factored into debt rating agencies calculations as well as equity betas. The end result is a reduced WACC and an increased share prices but only if the spend on such plans is less than the reduction in WACC plus the expected benefit in case of a disaster.

The next quote is as follows: "unlike NPV which requires an OCC (opportunity cost of capital), IRR analysis determines the interest rate and then compares this rate to the 'risk adjusted discount rate of return'." This is can be re-written as saying "unlike NPV which requires an OCC, IRR analysis determines the interest rate and then compares this rate to the OCC."

The risk-adjusted rate of return IS the opportunity cost of capital!

The rate calculated in IRR is actually the rate where $NPV = 0$. It is exactly the same formula. Instead of putting in a discount rate, guesses are made until $NPV = 0$. If you are going to calculate $NPV = 0$ and compare the rate to a pre-defined discount rate, why not just calculate NPV using that pre-defined discount rate.

Other problems with IRR are:

1. Are you lending or borrowing

Cash flow is not necessarily smooth throughout the project. Consider the example of writing a book: The publisher lends money to the author (i.e. project receives capital injection) then spends the money during Year 1 and Year 2 (creating negative cash flow in Year 2). In Year 3, the publisher lends to the project again which is followed again by cash outlays to form a negative cash flow in year 4. The results is that the IRR will potentially give a dubious answer because of the changing sign positive/negative) of cash flows in each year.

2. Multiple rates of return

Under the same cash flow scenarios outlined in 1 above (i.e. multiple changes in the sign of the cash flows over the time period invested), many projects will return more than one IRR. How? The calculation of IRR is simply any number that will solve for $NPV=0$ thus there can be more than one number that solves the equation. So, why not just calculate the NPV?

3. Mutually exclusive projects

IRR's calculated on mutually exclusive projects with differing upfront investments can lead to erroneous choices. The cause of this error can be removed if the more expensive project is analysed on an incremental basis compared to the less expensive project. However, the chance of this being done is low, and the temptation to make the straight comparison of IRR between one and the other is too great for most analysts.

With so many things against it, there isn't much left to be said for IRR as an assessment methodology. HOWEVER, having said this, IRR is significantly better than other investment selection methods like gut feel or payback (which says a lot for these) it just pales into insignificance when compared to NPV. Yet sadly our MIS magazine is quoted thus: "IRR is an adequate method...because it does not rely upon a 'correct' or 'agreed upon' internal calculation of the OCC [and is therefore] more useful than NPV in comparing unlike investments."

The final quote that must be addressed from this MIS article is the following: "One of the potential complications of pure ROI analysis is strategic fit considerations may be overlooked." It goes on to say how at the CBA this "inadequacy" is addressed by getting group technology sign off ensuring that it meets the strategic roadmap.

The question is, if a project doesn't align to strategy and yet creates greater value through an NPV / option pricing calculation then either the business strategy is wrong or the NPV is wrong. For example, is it possible for a project to have a positive NPV if the software isn't compatible to the hardware platforms or if the software solution is the antithesis of the IT strategy? Remember, NPV values the strategic value, it can hardly be positive if the project doesn't align to the strategy it is supposed to be valuing (unless of course, some smart business analyst has just proven that the current strategic thinking of the firm is poor and that a new path should be followed that will add significantly more value).

It is a constant source of amusement to listen to corporate Australia's project selection methodologies and to here respected senior executives and consultants alike talk about strategic value that only they can see. "No need to do an NPV on this project, it's a sure winner". This quote can be heard across executives and boardrooms of corporate Australia daily and it is usually about 3 years later that the CEO goes to market to announce a massive write down in some investment or another. Sometimes it buries them, others they live on to make the same mistake again.

And that brings us to the conclusion of this little corporate strategy article, because that's what NPV is. It is they way to value the strategic intent of the business and whether the cost of achieving that intent is greater then the value generated from it.

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