

Key lessons

- Understand the link between WACC and corporate strategy
- Take a sensible view on risk, and only count it once
- An $NPV > 0$ means you should invest.
- Paying more upfront for expertise should save on final costs.

Pitfalls in financial decision making for projects: Part 1 - by Eris O'Brien

The following are some observations on the pitfalls in financial decisions for projects.

We are all human which means we all make mistakes. The important thing is to understand what mistakes you can make in working on a project, and be aware of them.

Many of the following are basics that are either neglected in the rush to meet a deadline, or represent previous decisions fossilized into

the decision making system leading to bad outcomes.

Part 1 deals with:

- Cost of capital and project hurdle rates, and
- Financial decision making issues.

Part 2 will deal with:

- Financial modelling
- Cash flows and assumptions
- Understanding uncertainty, and

- Oversight in practice



Cost of capital and project hurdle rates

WACC versus the project hurdle rate

Getting the right cost of capital for your corporation is vital.

The weighted average cost of capital (WACC) is the return required to repay debt and adequately compensate investors for the risks they see when investing in your company.

For a single industry/sector organisation, the WACC includes the standard risks of that business.

For a multi-sector/industry company, the corporate WACC is an amalgam of all the businesses. Separate WACCs should be given for each of the major sectors you are involved in.

Individual projects are judged on a project hurdle or discount rate.

The hurdle rate for a project should differ from WACC only where the risks of the project differ from the normal corporate risk. If a project offers less risk than normal for the industry, it could well be argued that the hurdle rate should be lower than the WACC.

More debt is good, isn't it?

Only to an extent.

Beyond a certain point taking on extra debt actually increases the risk of default, which means that equity investors are exposed to more risk. In other words, increasing the level of debt will decrease your WACC up to a point where the increased risk will drive up demands for return on equity, after which it will go up again.

If your industry as a whole

doesn't leverage beyond a certain level of debt in their capital structure then there are likely to be sensible reasons for that

Spurious accuracy

The fundamentals underlying the calculation of the corporate cost of capital change almost daily, and experts may never agree.

Remember that you are trying to do two things with the WACC.

- 1) Repay debt and compensate your investors for the risk they are taking.
- 2) Set a financial target that matches your growth and investment strategy allowing you to compete within your industry.

In other words, the corporate WACC will likely be a range,

Cost of capital and project hurdle rates continued

not a single number accurate to the third decimal place.

In a competitive environment, getting new projects up will be difficult, so don't go straight to the top end of the range for WACC. This means that you will probably underinvest.

Don't forget also that the inputs to a project financial model may be little better than +/- 20% at the investment decision stage. Undue focus on the project hurdle rate is less productive than examining the other major assumptions of the project.

Double counting risk

Make a decision upfront about where you count the risk when financially evaluating a project.

The risk can be added to the hurdle rate or to the cash flow assumptions.

Whatever you do, don't add it to both as this may mean you are double counting the risk.

The outcome of double counting the risk is that you will likely pass over a lot of projects that you should be investing in as they never seem to pass the corporate investment criteria.

Conservative hurdle rate or unnecessary risk?

Decision makers often mean well when they increase the hurdle rates for projects. However, this often has unintended consequences.

First, the project can be made more risky as it may be deliberately undercapitalised, shifting more risk to the operating phase. Not only is it hard to estimate those increased operating risks properly, but this may also have adverse effects on plant reliability leading to problems with your customers.

Second, the hurdle rate for projects is the single most important link between corporate strategy and growth. If it fails to recognize higher risks of some projects, then the company is investing in projects that it shouldn't. If the hurdle rates are set too high then it is likely that your company will underinvest, leading to higher retained earnings, a probable decline in share price, and likely questions from shareholders on your actions. When you are underinvesting there is also a strong temptation to blame the business development team. Before firing them all, check your own assumptions first. Most of all, be realistic about your hurdle rate.

For example, if you are setting a hurdle rate of 18% and your industry long term average return is 10%, then the only projects you will get through the investment decision process are likely to be exceedingly risky. Hey, you may get a winner, but given the industry averages, this is unlikely unless you have a clear corporate strategy to achieve this.

The unwanted legacy of the favourite project

On the other side of the conservative project hurdle rate is the excessively generous hurdle rate given to favoured projects.

Don't forget that the corporate WACC represents the target level of debt that the company wants to carry. If you allow an on-balance sheet project to have a higher level of debt than the WACC allows for, then you may be handicapping future growth opportunities for the company. This is because less debt will be available for other projects.

One common solution for this is to give a corporate hurdle rate

for the investment decision of all projects so that the 'favourite' projects are not unduly favoured.

The subsequent financing decision can then offer higher debt to a project, based on forecast growth and debt requirements of the company. In other words, the favoured project should be compared fairly with other projects. Any advantages associated with higher debt then accrue to the corporation rather than the proponents of the project.

The exception to all this is where you project finance. That is, go off balance sheet for debt financing. As project financing is on a limited recourse basis, the corporation and shareholders have limited exposure to the risks of the increased debt. Also, the corporation's ability to take on extra debt is little affected, leaving the corporate WACC and the ability to finance projects on-balance sheet pretty much intact.

If a project has strong commercial and strategic reasons for going ahead and doesn't quite meet the investment criteria with the corporate project hurdle rate, consider project financing.

Throwing in the kitchen sink for good measure

In the mid-90's weighting a project hurdle rate with all sorts of risk adjustments was very much in vogue. Add in foreign exchange risk, regulatory risk, expropriation risk, force majeure risk due to civil strife, financial risk on repatriating funds, etc. and the project hurdle rate will go up very quickly.

One mining project I know of in the developing world was required to reach an internal rate of return (IRR) of 30% due to a number of reasonable sounding

"Undue focus on the project hurdle rate is less productive than examining the other major assumptions of the project"

Cost of capital and project hurdle rates continued

issues to do with doing business in that country.

This was for a mine type that would normally be lucky to break 12%.

The effect of this was that the project team was asked to find a mine an order of magnitude larger than had ever been found in the exploration stage before. While a 'stretch target' like this may seem admirable, it is likely setting you up for an expensive failure.

Put it another way, a 30% IRR represents the investment paying itself off in under 3 years. If you can't do this in a low risk operating and political environment, why on earth would you expect it to be possible in a high risk environment.

If you are about to enter a country that entails serious sovereign risk then look at what kind of

contractual and structural solutions you can apply and what kind of insurance may be available. These kind of solutions are considered normal in the world of project financing, so don't be afraid to take a leaf out of their book.

As tempting as it is to add all of the risks into the project hurdle rate, don't do it.

Simply increasing the hurdle rate is a lazy practice that will guarantee you have to explain to your shareholders why you are not investing the ever increasing retained earnings.

Key lessons

- Set your WACC at a reasonable level for your industry.

- WACC is the single most important link between corporate strategy and investments. Treat it seriously.
- Increasing levels of debt only helps up to a certain point, after which the increased risks of default mean that the cost of capital increases again.
- Resist the temptation to unnecessarily add risks to the project hurdle rate. If a project has the same risk profile as the corporation, then the hurdle rate should be very close to WACC.
- Understand that setting a higher project hurdle rate is not conservative, it is more likely forcing the project to be more risky. Is this what your shareholders really want?

"Remind people at all times that an NPV of zero is acceptable."

Financial decision making issues

Key parameters

The investment decision for a project usually boils down to a simple decision. Does the project meet the target financial parameters?

The normal target parameters are net present value (NPV) and internal rate of return (IRR).

The net present value is calculated by discounting future net cashflows and subtracting this from the capital cost.

The internal rate of return of a project represents the discount rate that gives a project an NPV of zero.

In both cases, it is the validity of the cash flows and the capital cost assumptions that determine the outcome.

The investment rules are.

IRR rule

If Project IRR > Target IRR then invest.

NPV rule

If project NPV > 0, then invest.

NPV rule gone wrong

Remember that an NPV of zero means that the project will repay its debts and provide adequate compensation to the shareholders.

Remind people at all times that an NPV of zero is acceptable.

Wind fall returns (EVA, Alpha, or whatever you want to call it),

are nice, but if you only chase windfall returns you will ignore the projects that will add real value to your company.

In companies that misapply the NPV rule, the business development team will become a cost burden over time due to the lack of delivered projects, with management looking to cut numbers of their staff.

If you are a manager looking to toe cut your business development team, first try and benchmark yourself against your competition. Are you being unrealistic?

Capital rationing

NPV and IRR don't give a clear indication of the size of a pro-

Financial decision making issues continued

ject. For example, if you need to choose between two projects due to capital constraints, NPV and IRR won't necessarily give a clear answer.

One answer to this dilemma is called the profitability index, which allows you to effectively rank projects based on the size of the investment and its returns.

It is also important to remember that capital constraints can be worked around. If you have a project that will provide the kinds of returns that will compensate investors for the risks taken then it is likely that you can raise sufficient funds, one way or another, to invest.

Stages of decision

Projects pass through several decision gates. The investment decision is typically based on the following:

- Scoping stage
- Pre-feasibility Stage
- Feasibility Stage

The financing decision typically occurs after the investment decision and looks at how the project can best be financed. This usually represents the icing on the cake.

After the project is approved, detailed engineering, design and construction commence.

Killing a good project too early

As the law of gravity is to the science of physics, there are several laws of projects that occur as the project advances.

1. IRR and NPV go down.
2. Capital costs go up
3. Production goes down
4. Operating costs go up

As a lot of organizational time and funds go into projects it is important to understand the likely outcomes of a project as soon as possible. This can lead to a temptation to kill projects as soon as they show signs of not meeting key parameters.

If you are not careful, this can lead to a 'guilty until proven innocent'. This can be a poisonous mentality that fails your shareholders.

To get a project across the line is a major battle, you will have to kick, bite and scream to get it there.

Leadership is crucial, both in the project team and at the Board level.

IRR will go up and down like a yo-yo, capital cost estimates can change weekly, operating costs get more and more padded, and so on.

A project is not for the faint-hearted!

In other words, try and focus on those projects that make the most strategic and commercial sense to the company, and avoid taking a scattergun approach, looking at everything.

What I am trying to say is that if a project is fractionally under the required hurdle rate at a decision gate, don't just kill it without remorse. Look at the project. If there are sensible strategic and commercial reasons for doing the project, then don't just discard it without further thought.

Ways to save a project

If a seemingly good project only just fails your financial criteria, the following is a list of fundamental questions to ask when trying to save a project include –

- Can you get alternative suppliers/vendors?

- Can you use second hand equipment? (Be warned, most engineers hate this)
- Do you have the right people on the job? (inexperience can lead to either over or underestimating)
- Can you delay the project until conditions improve? (e.g. better exchange rate, better unit price for your output, or lower cost of debt)
- Do you even need to make the decision to kill the project now? (Could it mature for a few months while you continue with lower cost critical path activities and be reviewed again later, when conditions might have changed?)
- Is the design right? (Value engineering may help as engineering houses will often dust off a plant design from a different location without tailoring it specifically to your needs. This is less relevant for projects that are standardized with known reference plants).
- Can you project finance the project to achieve a lower hurdle rate through the use of more debt with little increase in risk to the equity owners.

Maintain a sensible attitude

It is important that all concerned understand that there are a range of possible outcomes, rather than a single number.

It is not too easy for senior management and the Board to be overly risk averse and turn a project down.

Work with the project team to solve problems. You should expect things to change for the worse from time to time. The key issue is to work through those problems and not revert to finger pointing.

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Financial decision making issues continued

A culture of fear and blame is counterproductive. Morale will go down, problems will only be raised to the senior management level when they are almost too late to solve, and the senior managers will be tempted to micro-control the project as they are suspicious of the project team.

Typically organisations only occasionally take on new projects, so the senior management and Board tend to be dominated by operational and administrative staff with little if any project development experience. Bring on independent advisors, or Board members with project development experience.

The early bird gets the worm

Study after study show that the greatest chance of positively influencing capital costs and project outcomes is in the early design stages.

That is, your final capital costs will be more influenced by the design of the plant than by clever construction contracts and financial engineering.

Design engineers usually try to offer a sensible outcome for a reasonable price. This often means that the design comes from a reference plant somewhere else in the world rather than being tailored for you.

Don't be afraid to throw a couple of good engineers at the problem and see if there are sensible modifications for your project in terms of technology or scale.

A clear scope leads to a clear outcome

Related to the importance of changing the design earlier is the importance of having a clear

scope for the engineers to work with.

This scope should take in upfront cost considerations, operational requirements (labour, maintenance, operating costs, reliability, etc.), quality of product, and so on.

Ask any contractor what the major cause of cost blow out is and the answer is almost always scope creep.

Almost anybody who has built a house understands this. You go to an architect who gives you a great set of drawings, but when you come to building it you find that the dimensions of materials doesn't match the diagram, leading to wastage, additional labour for design details, and so on. All of this either requires a redesign or paying out for the extra costs, or both.

Make sure that you have the right people scoping the project upfront.

More is less—paying for success

Bringing a project to an investment decision can be expensive.

Don't be surprised if the costs of a feasibility study represent 5% of the final estimated capital cost.

If you are spending much less than that, then it is likely that you are making the investment decision on false premises. That is, your capital cost estimates will be less accurate than normal, the scope will likely vary considerably, and the design may not be right in the first place.

It is only too tempting to get on with delivering the project as soon as possible. I am not suggesting 'paralysis by analysis' here, just making sure that you have the right people designing

the project and making the assumptions that go into the financial decision.

Managers can be tempted into proving that they can deliver projects at the lowest possible price. That is, instead of getting the project right, and putting the best people on the project, they try and cut costs on the front end and proudly tell their superiors and colleagues about this.

They need to understand that this is likely to be a false economy, with the scope poorly defined, cost estimates untested to reality, designs not thought through, and the wrong people delivering the project. The last of these possible outcomes requires some comment.

One of my favourite examples of the false economies of scale relates to project management. For example, if the standard compensation for a great project manager is \$300,000 per annum, then insisting on only paying \$100,000 as any higher would upset other employees and managers, will lead to the engagement of a third-rate project manager. A good project manager can save millions of dollars and deliver a project on time.

Skimping on the right skills to bring the project home will likely cost you more in the end.

If you are involved in project financing then the upfront costs will be higher again as to receive limited recourse funding you will need to clearly identify key risks and put contractual and structural solutions into place. The level of detail and documentation is much higher than for a standard project.

Hedging everything – the curse of the risk averse organisation

The recent advent of behavioural economics and finance

“Don't be surprised if the costs of a feasibility study represent 5% of the final estimated capital cost.”



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Disclaimer

This newsletter is an opinion piece. It does not represent investment advice or management theory – just personal opinions intended to help bridge the gap between the textbook and the real world.

The opinions represented are based on broad experience with many organizations and endless discussions with colleagues in many industries, in several countries, and are not representative of any individual organisation.

Financial decision making issues continued

has underlined a classic human behaviour that colours all decisions. That is, people will give up profit to decrease the chance of loss.

This is sensible to a certain degree but becomes a problem when the company is so risk averse that it does not take the risks that are considered normal for that industry.

If you de-risk a project by eliminating the downside, then by definition you are eliminating the upside. Remember the risk-reward relationship— less risk leads to less reward.

Shareholders diversify their risk by investing in multiple companies and sectors. You should not be de-risking a project too far yourself. You should be taking the normal risks associated with your industry.

I personally blame the misapplication of risk management theory for this trend. After the mind-numbing tedium of week long risk workshops, many managers come out with the idea that risk is bad and that if they can identify a risk then it should be

avoided. This is wrong thinking. Business is about taking calculated risks to make a profit.

My advice to managers in a highly risk averse environment is to find experts who understand the risk to come help you with it. You may find that you are uniquely well placed to take on risk and can turn this to your commercial advantage.

Life is about sensible risk allocation – bring this attitude into the project environment too.

Key lessons

- Understand that NPV and IRR are the result of many assumptions which go into building the cash flow.
- Don't just kill an otherwise good project because it is a fraction under your financial investment criteria, look at how you can make it work.
- Projects use up a lot of valuable time in your organization, so limit the

projects you pursue to those that meet your company's strategic and commercial drivers.

- If you find a good project in a non-core area, then you can sell it, create a new subsidiary or company, and so on.
- Design changes early on lead to the greatest project cost savings.
- Lock in scope up front, and make sure you have the right experts involved in designing it.
- If your company doesn't develop many projects, then project development expertise should be brought in.
- Expect to pay upfront for a successful project. If the responsible managers are seeking to show that they are superior at saving the company funds by cutting the costs of the feasibility study, be suspicious.