
Optimising a Share Price

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Introduction

The procedure by which the optimum value of an open pit can be determined is widely understood and almost universally adopted. Optimising open pits has become such ubiquitous practice that a third definition of the verb "to whittle" could probably be added to the dictionary.

Not so well understood is the impact of an optimum pit value on a company's share price. While the optimum pit value is clearly a determinant of share price the maximum cumulative negative cash flow (cash flow deficit) from a pit can be a more important determinant of share price.

For a small mining company to fund a mining project it will invariably need to raise new equity, therefore it is important to establish an issue price that will be attractive to new investors and will also be beneficial to existing shareholders. It is the contention of this paper that if the equity issue price cannot be made attractive to both new and existing shareholders then the project is not suitable for the company regardless of its intrinsic worth.

It must be understood that "pit optimum" does not necessarily equate to "company optimum". This paper addresses issues to be cognisant of when optimising for shareholders of small to medium size mining companies.

Share Price Valuation

Mining practitioners are constrained by the Valmin Code. For the purposes of this paper it might be useful to explore the valuation techniques used by market practitioners who are not so constrained. The market employs a plethora of techniques to value mining shares most of which, in my opinion, are distant relatives of true worth.

Market capitalisation per resource ounce is a popular measure of value for both listed securities and mineral property transactions subject to evaluation on the basis of consideration paid per resource ounce. This technique has some small flaws that may trouble potential investors not experienced in the industry. For example, a resource of several squillion ounces may appear to be justify a ten digit market capitalisation however when revealed as an underground refractory deposit then the true worth is likely to be several digits less.

Cash flow per share (CFPS) remains a popular measure of value, its popularity stemming from its ability to make insolvent companies look like real winners. Cash flow per share is defined by the broking fraternity as Net Profit add back non-cash items such as depreciation and amortisation. In the mining industry where capital events tend to be large and infrequent, CFPS is a very useful valuation technique for disguising poor capital investment decisions as capital does not count toward cash flow!! CFPS can be maximised by capitalising costs of

operation as the subsequent amortisation actually adds to cash flow!! Using this technique it is possible for a company with a notional positive cash flow of tens of millions of dollars per annum to experience solvency problems.

Earnings per share (EPS), with its derivative, the Price Earnings multiple (PE), is probably the most widely adopted valuation technique for listed shares. EPS is defined as Net Profit after Tax divided by the number of shares on issue. PE is simply the price per share divided by the earnings per share and can be simply understood as the number of years' earnings required to pay for the share. Because EPS valuations include non-cash charges (depreciation and amortisation) they are prone to distortion by exaggerated mine life thereby reducing the annual depreciation and amortisation charges.

Dividend yield techniques are not widely used to value shares in mining companies. The theory of returns to shareholders relies on the basic tenet that investment choice sits better with the investor than with the director of a mining company. The theory is not regularly tested by junior mining companies.

Previous expenditure techniques are sometimes used to value exploration tenements. The general principle of this technique is that the value of a tenement is directly proportional to previous expenditure on the tenement. Some heretics, mainly mining engineers, have suggested that the value of a tenement may actually be inversely proportional to the sum of previous expenditures.

Net Present Value (NPV) techniques are increasingly applied to the valuation of mining shares. The methodology is generally used to establish the NPV of individual assets which can be aggregated. Deductions are made for corporate liabilities such as debt, overheads and taxes. Additions are usually made for non-cash flow assets such as exploration and

intellectual property rights. This allows the analyst some flexibility in attempting to arrive at the answer he first thought of.

Market Value is a technique applied by some older and wiser market practitioners. This method assumes the value of a mining share is equal to the cash in your pocket after you sell it. This technique can also be applied to mining properties whereby the value is equal to the cash in your pocket after the property has either been "dug-up" and sold or "dressed-up" and sold. Naturally it goes without saying that all mining properties are worth far more "dressed-up" than "dug-up".

Ramping is a pro-active valuation technique rather than the passive techniques discussed so far. Ramping is applied by the directors of the mining company in much the same way as the Rule of Thumb was applied by Scottish husbands under Roman law. The Rule of Thumb stated that husbands could beat up their wives but only with a stick no thicker than their thumb. Similarly directors may beat up their share price but only with a drill hole intercept no thicker than the Chairman of the Board.

A semi-serious valuation technique. In making an empirical rather than arbitrary valuation of the shares of a mining company there is little alternative but to employ the NPV technique. To calculate the NPV per share we need to establish firstly a company cash flow and secondly how many shares are on issue.

Company Cash Flow

It is useful to describe the cash flow of the company as the "cash flow accruing to the benefit of shareholders". This corresponds to the Net increase/(decrease) in cash held before Dividends are paid. This is tabled in Statement of Cash flows in the company accounts.

The simplest cash flow will usually include the following items:

Cash flow from operations

- Revenue
- Operating costs
- Interest received (paid)
- Tax paid

Investing Cash flow

- Exploration
- Mine development
- Property plant and equipment
- Sale (Acquisitions) of assets

Financing Cash flows

- Equity issues
- Debt drawdown (repaid)
- Finance lease repayments

Having established the company cash flow it is a simple matter to calculate the NPV of those cash flows. When selecting the appropriate discount rate, it should be remembered that we are calculating the value of a share in a mining company at an investor's cost of capital and not the value of a mining project at the company's cost of capital.

For a small mining company to fund a mining project it will invariably need to raise new equity, therefore it is important to establish an issue price that will be attractive to new investors and will also be beneficial to existing shareholders. It is the contention of this paper that if the equity issue price cannot be made attractive to both new and existing shareholders then the project is not suitable for the company regardless of its intrinsic worth.

The individual elements of Cash flow from Operations and Investing Cash flows are integral to Whittle Optimisation and it is most unlikely that the author will be able to improve your understanding of these components. However the items under Financing Cash flows are of critical importance to Share Price Optimisation and a brief discussion of these will be beneficial.

Finance Lease Repayments are typically the costs of ownership associated with mobile plant, power stations and sometimes fixed plant. In general, these items only appear when the company elects to conduct its own mining/power supply activities and purchases the equipment under a finance lease. Where the company contracts out these activities, the cost of ownership will be included in the contractor's rates and will therefore appear as an Operating Cash flow. It is generally better to treat the finance lease obligations on mobile equipment as an operating cost.

Debt drawdown (repaid). Ideally a new project should support some debt finance. The extent to which a project will support debt finance is subject to a few rules of thumb.

Firstly, no banker in his right mind will lend a geologist, or even a mining engineer, all of the money required to develop a project. Generally project debt is limited to 60-80% of the total development costs.

Secondly, after lending you a paltry sum that hardly covered his fees let alone the lunches, the banker will want to be repaid. Because the banker has had prior dealings with geologists he is very suspicious about the reserves and therefore applies a Loan Life Ratio of 2.0 times. This means the mine life must be at least twice as long as the loan life.

Thirdly, when the company finally agrees to repay the money, the banker will insist on being repaid in regular instalments. Because the banker has had prior dealings with mining engineers he is very suspicious of the forecast operating costs and therefore applies a Debt Cover Ratio of 2.0 times to the repayment. This means the cash available for debt service in any period must be at least 2.0 times the amount required to meet interest and principle repayments.

Finally, after all this grief, the banker will want to know if the project is actually going to work. Because the banker has had prior

dealings with metallurgists he is very suspicious of the process flowsheet and therefore will require a Process Guarantee from the process design engineer. This means bankers as a collective genre do not understand metallurgy otherwise a suitable ratio would have been devised to cover this risk. It would also suggest that the banker has not had prior dealings with a process design engineer.

Equity issues: By applying the above rules of thumb to the project cash flows it is possible to estimate the level of debt a project will support. The balance of the project funding will need to be made up from cash reserves or by the issue of new equity.

Shares on Issue

An iterative process is required to determine the number of shares on issue because the number of shares on issue will often depend on the price of the shares which in turn is determined by the company value divided by the number of shares on issue. The shares on issue will include all fully paid ordinary shares but should also include all classes of paper that are likely to become fully paid ordinary shares entitled to ordinary dividends. It will be useful to discuss how to treat several other classes of security when valuing the shares of mining company.

Options generally convert to fully paid ordinary shares upon the payment of an exercise price on or before a specified option exercise date. If the share price exceeds the option exercise price on the exercise date then the options will normally be converted resulting in an increase in the number of shares and an injection funds to the company. If the share price is below the option exercise price then the options will generally be allowed lapse.

Partly paid shares convert to fully paid shares upon the payment of the unpaid amount. Partly paid shares are usually distinguished from options in that

conversion is triggered by the company "calling" the unpaid amount due on the partly paid share. The likelihood of the call being met will again depend on the call amount relative to the share price.

Preference Shares and Convertible Notes can be classified as quasi debt instruments whereby preferred dividends or interest is paid on funds subscribed and the funds subscribed are either repaid upon maturity or converted to shares depending on the terms of the instrument.

In order to determine a value per share, it is essential to determine the timing and quantum of funds the company will receive as a result of equity issues from the placement of fully paid ordinary shares, option exercisements, partly paid calls and from quasi debt instruments. It is also essential to determine the number of fully paid ordinary shares that will be in existence as a result of equity issues.

Meanwhile Back in the Surreal World

Let us consider the example of the Whittled Down Gold Project owned by Blue Sky Mines.com NL. There are 50 million Blue Sky Mines.com shares on issue which are trading at \$0.50, giving the company a market capitalisation of \$25 million. The Whittled Down mine is the company's only asset apart from \$10 million cash. The company is considered well managed with the board comprising two well-respected lawyers, an accountant and a dentist. The market's respect for management is manifest by a market capitalisation that is actually trading at a premium to cash backing.

The project is located in Monte Carlo so no tax is payable and the directors live in Never Never Land so there are no head office charges.

Project Background. The project has a reserve of 20 million tonnes grading around 3g/t. It is amenable to the CIL treatment process with anticipated recoveries of 93%.

Mine Plan. The Bankable Feasibility Study has been completed for 2 million tonnes per annum of treatment facility producing 180,000ozpa. The first one million tonnes of ore will be extracted from a supergene zone grading 4g/t.

Pre Strip. The deposit has an overall strip ratio of 7:1 with a substantial pre-strip component. Half of the total waste moved will be mined in the first three years.

Mining costs are expected to be \$1.10 per tonne of material in the first year and increase \$0.20 per tonne in each subsequent year due to the simplicity of the autofill function in Excel.

Treatment costs are expected to be \$10 per tonne of ore for the first five years and increase to \$12 per tonne of ore mined in the last five years because the work index instantaneously increases after year 5.

Construction will commence immediately and capital costs are anticipated at \$45 million with a \$5 million contingency.

Gold price is expected to be A\$500 per ounce in line with the universal assumption that the long term gold price will be 10% greater than today's spot price.

Project Finance: As a result of the special relationship the chairman has with MeinBank, MeinBank has agreed to lend 60% of the project capital. MeinBank has stipulated a loan life ratio of two and a debt cover ratio of two.

New Equity: The balance of the capital requirements will be achieved through a share placement to the clients of MeinBroker. The managing director is currently negotiating the price of the placement with the broker.

Broker Support: MeinBroker have never traded the shares of Blue Sky Mines.com NL, however due to an acrimonious falling out with the previous broker to the stock, MeinBroker have been chosen to raise the equity capital.

Directors' Interests: The directors of Blue Sky Mines.com NL have very significant shareholdings with their combined interests totalling 45% of the issued shares.

Current Market Value is simply the number of shares currently on issue multiplied by the current share price.

Project NPV is the real Net Present Value of the Operating and Investing cash flows less interest received (paid).

Future Market Value is derived by calculating the NPV of the cash on hand plus the company cash flows including interest, equity issues, and debt movements. The Future Market Value is divided by the shares on issue after project financing to establish a Future Share Price.

The Model

For illustration purposes a model has been constructed to evaluate the benefits of project development for new and existing shareholders. (A worksheet for the Base Case using a 50c issue price scenario appears overleaf.)

Cases: Three related cases have been selected:

- The Base Case where capex is \$45 million. (cell D20)
- The Contingency Case where capex is \$50 million
- The Grade Case where grade in year 1 is lower (2g/t) and higher in the last two years (4g/t) (cells G4, N4, O4)

Scenarios: For each case 10 scenarios have been calculated for different share placement prices between 10cps to \$1.00 per share. (line 37)

Output: For each issue price the model calculates:

- the number of shares to be issued in order to fund the project (line 36), and
- the Future Share Price for the company assuming the project will be developed (cell F42).

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	PRODUCTION	year	Variables	99	00	01	02	03	04	05	06	07	08	09
2	Material mined	mt	7	0.0	12.0	30.0	25.0	20.0	18.0	14.0	10.0	4.0	2.0	1.0
3	Ore treated	mt		0.00	0.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
4	Head Grade	g/t		0.00	0.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	Recovery	%		93%	93%	93%	93%	93%	93%	93%	93%	93%	93%	93%
6	Production	koz		0	0	120	180	180	180	180	180	180	180	180
7	Mining costs	\$/t		0.00	1.10	1.30	1.50	1.70	1.90	2.10	2.30	2.50	2.70	2.90
8	Treatment costs	\$/t		10.00	10.00	10.00	10.00	10.00	10.00	12.00	12.00	12.00	12.00	12.00
9	Administration costs	\$/t		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
10														
11	COMPANY CASHFLOW	year		99	00	01	02	03	04	05	06	07	08	09
12	Cashflow from Operations													
13	Revenue	\$m	\$500	0.0	0.0	60.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
14	Operating Costs	\$m		0.0	0.0	(22.4)	(48.0)	(51.2)	(54.4)	(61.6)	(64.8)	(68.0)	(71.2)	(74.4)
15	Interest received (paid)	\$m		0.5	0.1	(3.0)	(3.3)	(2.0)	(0.6)	0.9	2.5	3.5	4.5	5.5
16	Tax paid	\$m		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	Investing Cashflow													
18	Exploration	\$m		(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(1.0)	(1.0)
19	Mine development	\$m		0.0	(13.2)	(29.9)	(16.5)	(10.2)	(7.6)	0.0	0.0	0.0	0.0	0.0
20	Property plant and equipment	\$m	45.0	(4.5)	(36.0)	(4.5)	(2.3)	(2.3)	(2.3)	(2.3)	(2.3)	(2.3)	(2.3)	0.0
21	Sale (Purchase) of assets	\$m		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
22	Cumulative (Deficit) Surplus	\$m		2.0	(51.1)	(54.9)	(38.9)	(18.6)	2.5	25.6	47.0	66.3	86.4	111.5
23	Financing Cashflows													
24	Net Equity Issues	\$m		0.0	22.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	Debt drawdown (repayments)	\$m		0.0	31.9	2.3	(8.5)	(8.5)	(8.5)	(8.5)	0.0	0.0	0.0	0.0
26	Finance lease repayments	\$m		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	Net increase (decrease) in cash	\$m		(8.0)	1.1	0.1	7.5	11.8	12.6	14.5	21.4	19.3	20.1	25.1
28	Closing cash balance	\$m	10.0	2.0	3.1	3.1	10.6	22.4	35.0	49.5	70.9	90.2	110.3	135.4
29														
30	FINANCE	year		99	00	01	02	03	04	05	06	07	08	09
31	Opening Project Debt	\$M		0.0	0.0	31.9	34.2	25.6	17.1	8.5	0.0	0.0	0.0	0.0
32	Drawdown	\$M	60%	0.0	31.9	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
33	Repayment	\$M		0.0	0.0	0.0	8.5	8.5	8.5	8.5	0.0	0.0	0.0	0.0
34	Closing Debt	\$M		0.0	31.9	34.2	25.6	17.1	8.5	0.0	0.0	0.0	0.0	0.0
35	Opening shares on issue	Million		50.0	50.0	94.6	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
36	Shares issued	Million		0	44.6	3.2	0	0	0	0	0	0	0	0
37	Issue price	\$	\$0.50	0.00	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	Closing shares on issue	Million		50.0	94.6	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8	97.8
39														
40	Pre Project Company Value		50 million shares		\$ 0.50 per share		\$ 25.0 M		market capitalisation					
41	Project NPV @ 10%						\$ 26.1 M		IRR = 20%					
42	Post Project Company Value		98 million shares		\$ 0.57 per share		\$ 55.3 M		market capitalisation					
43														

Table 1: Work Sheet for BaseCase

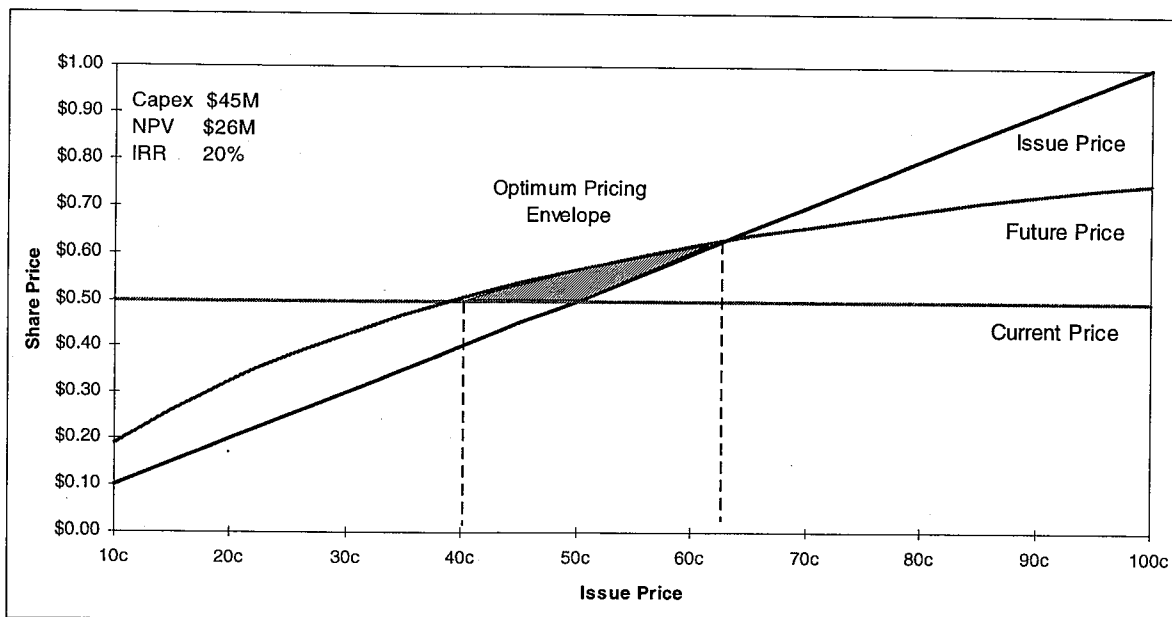


Figure 1: Base Case

The Base Case illustrates that while the Whittled Down project is very robust it is not necessarily a good project for either the existing shareholders or the incoming shareholders.

The incoming shareholders will make a positive return on their investment if the issue price is below 63cps. If the issue price is above 63cps the incoming shareholders will lose money. As would be expected, the lower the issue price the bigger the return to the incoming shareholders.

Obviously the existing shareholders will be happy with the outcome provided the future share price is greater than the current share price. This occurs as long as the issue price for the placement is greater than 40cps.

A number of points need to be made:

- The economics of the Whittled Down project in this case are sufficiently robust that everybody can make money - bankers, existing shareholders and new shareholders.

There is an “**Optimum Pricing Envelope**” within which the new issue can be priced such that both the existing and incoming shareholders happy (40-63cps).

- There will be conflict between the broker to the issue and the directors over the issue price. Because the broker has no clients in the stock he will want the issue price as low as possible. Because the directors make up the majority of the existing shareholder base they will want the issue price as high as possible.
- Where the eventual issue price is struck has very little to do with value and everything to do with the relevant interests of the participants.

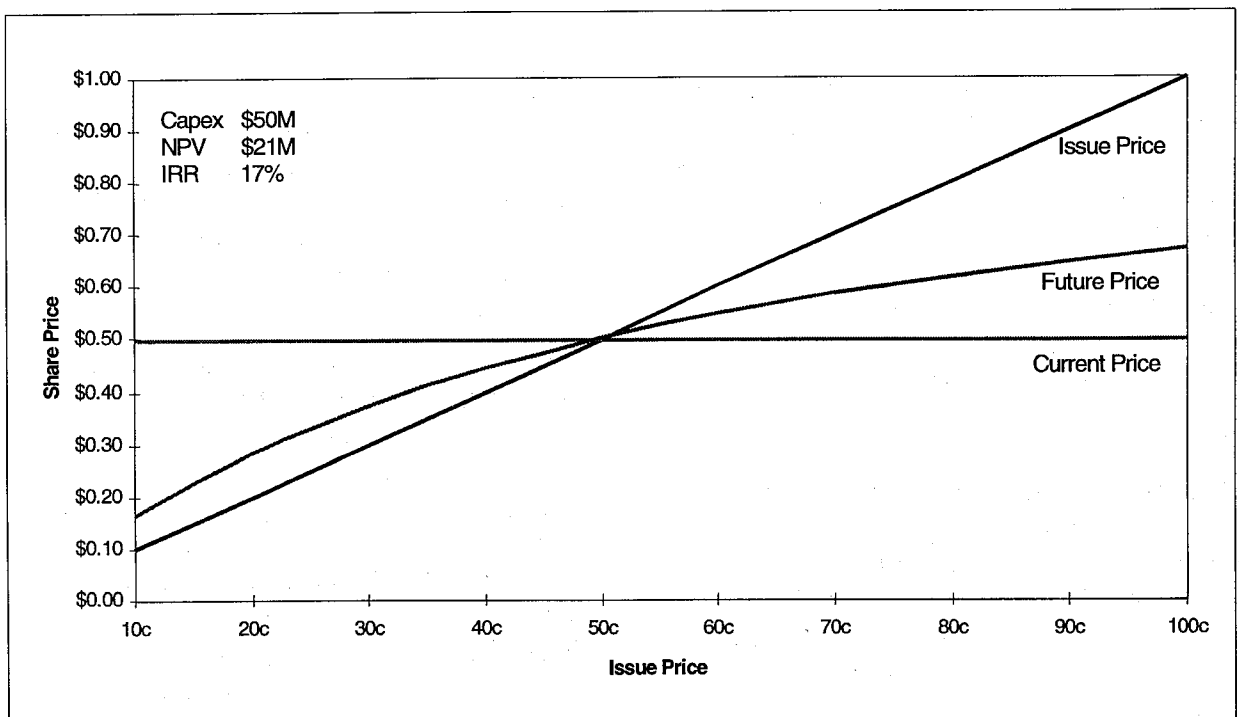


Figure 2: Contingency Case

The Contingency Case illustrates that while a relatively small change in capex (10%) only results in a 20% drop in the NPV at an acceptable IRR, the project cannot make

both the existing shareholders or incoming shareholders happy. There is no possible Optimum Pricing Envelope within which both new and existing shareholders will make a positive return.

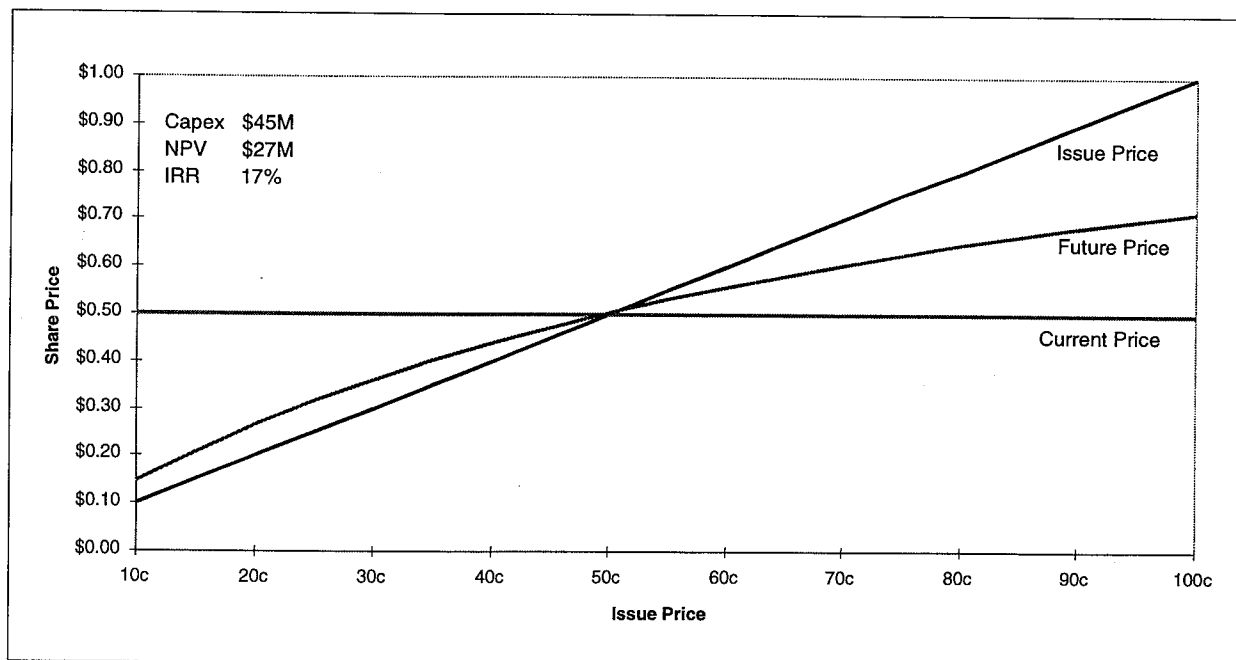


Figure 3: Grade Case

The Grade Case illustrates that while small changes in grade in the first year and last two years result in a larger project NPV, the future value per share is lower because the maximum cash deficit required to be funded is higher resulting in the issue of more shares. Again there is no optimum pricing envelope where both new and existing shareholders will be happy.

Conclusions

Optimum Pricing Envelope: For any project development requiring new equity funding it should be determined whether there is an Optimum Pricing Envelope within which a new issue can be made to the benefit of new and existing shareholders.

Optimum Share Price Value may not necessarily be achieved by the optimum pit.

The maximum cashflow deficit, and the quantum and price of the new equity issued to fund that deficit, are parallel determinants of future share price value. A lower pit NPV may reduce the equity issued by the company and therefore increase the NPV per share.

Valuation techniques. While this paper has focused on NPV techniques, the benefits of project development for both existing and new shareholders can just as easily be estimated using other techniques. Indeed most providers of equity funds will utilise other techniques such as Price Earnings Multiples and Cashflow Ratios. Therefore it is not only possible but also prudent to analyse how a project will impact these value measures.

Pro-active valuation (Ramping) has no impact on current value. It does however

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have a large impact on perceived value and therefore increases the likelihood of a new issue being made at a higher price. This will result in a real value add for existing shareholders by limiting the number of shares on issue.

Disclaimer

The views expressed in this paper are those of the author alone and are not the views of Murchison United NL.

This paper is intended to provide general information only and is not a substitute for expert advice appropriate to individual circumstances.



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