

Quarry



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ASSESSING OPERATIONAL RISK FOR MARKET VALUE PURPOSES

Assessing a quarry's operational risk is a key aspect of determining the market value of the operating business or its geological resource as an asset. Chartered surveyors Shaun Barry and Darren Herdman explain.

In a discounted cash flow (DCF) or capitalisation of future income valuation of a quarry operation or asset, the discount or capitalisation rate reflects uncertainty and risks to achieve positive cash flows or income streams from the quarry business or asset.

There are three broad approaches to calculating the market value of a working quarry: market, cost and income.

Market- and cost-based approaches rely on past transactions and cost data. The income-based approach assumes that a valuer can model the future economic returns of a quarry business or asset based on the information available at the valuation date.

In a market-based approach, comparable sales evidence for an individual quarry is rare. Usually, sales evidence is dated or associated with a company takeover or a larger land deal and is therefore difficult to analyse. Furthermore, it is unusual for two quarry sites to be truly comparable, even after reasonable adjustments are made to the data relied upon for valuation purposes.

In the cost-based approach, equipment and site improvements are depreciated and represent only a portion of the going concern value of the business. When valuing an operational going concern, the cost approach neglects the goodwill of the business.

The best way to value a quarry is an income-based approach with a DCF method, if tasked with valuing the operating going concern, or a capitalisation model, when valuing the quarry resource as an asset.

DISCOUNT RATE

In the DCF method, future maintainable profits are estimated and discounted at a commensurate rate of return an investor would expect in such a business. The future maintainable profits can be based on actual profits in the period before the valuation.

Similarly, the future maintainable royalty income stream a freeholder of a resource asset enjoys will be capitalised at a rate he/she deems to be a suitable rate of return from

Category:	Risk Rating							
	Likely	Impact	Index	Low	Low/Med	Medium	Med/High	High
Market	5	4	20	-	-	-	20	-
Asset	5	5	25	-	-	-	-	25
Cashflow	3	3	9	-	9	-	-	-
OPS Man.	2	2	4	4	-	-	-	-
Overall Risk	3.8	3.5	13.1	-	-	13.1	-	-

Figure 1. The Risk Rating Matrix.

the initial investment. The rate should reflect the risk of achieving the royalty income over the term of the lease or licence agreement or life of the remaining resource.

For the DCF method, the discount rate reflects uncertainty and risks to achieve positive cash flows from the quarry. However, it is difficult to determine the appropriate discount rate due to the large number of variable risk factors that need to be considered and, as such, can be subjective and open to interpretation.

A discount rate comprises the systemic market risk and specific project or quarry business risk. The weighted average cost of capital (WACC) represents the minimum capital providers require. The WACC of the quarry is the average rate the business pays to its security holders to finance its assets. It is the proportionately weighted cost of debt and equity. This will vary between operators, dependent on debt ratio and equity financing.

CAPITALISATION RATE

Market rates of return for equity-type investments are evaluated with the capital asset pricing model (CAPM). The CAPM's results can then be incorporated with the debt funding cost to determine WACC for the business and address systemic market risk.

To calculate the capital value of the remaining resource as an asset, the valuer will consider the future notional royalty income stream from an operation, and then apply an appropriate capitalisation rate. This rate should reflect the risks of the operation while having due consideration to the

opportunity cost of an alternative investment.

With reference to more conventional property valuations, the capitalisation rate represents the gross yield of an investment and is usually calculated by dividing the annual rental income achieved from the property by the current market value of the property. This represents the conventional property investment systematic risk.

The capitalisation rates for quarry asset values should include the conventional property systematic and business asset risks.

Each quarry has specific risks that impact business and asset value. These can be broadly divided into four areas:

1. Markets that drive demand for products, given current and planned infrastructure projects. Close proximity to developing infrastructure projects due to the high costs involved in transporting the construction materials is advantageous.
2. Asset or geological resource quality and quantity to provide a variety of product to the market. The mining industry's code for reporting exploration results, mineral resources and ore reserves is the Joint Ore Reserve Committee (JORC) 2012 Code. Mineral resources are categorised in increasing geological confidence as inferred, indicated and measured. A defined JORC Code-compliant resource is an advantage. These definitions are becoming more broadly accepted by the quarrying industry as the appropriate classification of quarry resources and reserves.
3. Cash flow and income stream strength

in relation to margin achieved. Selling a high value product produced by an efficient low cost operation providing a strong cash flow margin and or income stream for the business or landowner is an advantage.

4. Experienced operational management has a positive impact on a quarry's profitability.

RISK RATINGS AND PREMIUMS

InSitu Advisory assesses these risks to determine the "likelihood" and "impact" on the operation's value using a risk rating matrix (see Figure 1). The index is divided into low, low/medium, medium, medium/high and high categories.

The overall risk rating assesses a risk premium that is added to the WACC to determine a rate to discount the projected cash flow of the subject quarry operation.

In a hypothetical example, a quarry is situated in a difficult market where it is likely that any change will impact on its value. The geological resource is not well defined, and

only allows for lower quality construction materials to be produced. There is limited possibility to produce a range of higher value products. However, the operation is well run and generates a good cash flow margin with the assistance of an experienced management team. On this basis, a risk rating of 13.1 is determined (Figure 1).

Analyses of recent overall risk ratings and premiums applied in discount and capitalisation rates for DCF and capitalisation model market valuations allows the valuer to determine a relationship between these variables. The relationship is then applied to determine an appropriate risk premium rate for the hypothetical quarry. This is added to the WACC to determine a nominal after tax discount rate applied in the DCF valuation.

On this basis, a quantitative risk assessment method of a quarry business is used to determine an appropriate discount rate for a DCF market valuation and a capitalisation rate when valuing the remaining resource as an asset. Each business will have its own specific assessed


risk index and unique business risk premium.

SCIENCE OVER INSTINCT


A market value of a quarry is determined by discounting future cash flows with the WACC and its uniquely derived business risk premium. Likewise, when valuing the remaining resources as an asset, the capitalisation rate adopted to value the notional income stream will reflect similar risk. A risk matrix evaluation, while subjective in part, based on experience with analytical assessment, is used to determine the risk premium. As such, it is an essential part of determining the market value of a business or the remaining realisable resource asset.

The outcome of the risk assessment is incorporated in determining the discount and capitalisation rates. It provides a more scientific basis than a subjective gut feel that is often adopted by valuers. •


Shaun Barry and Darren Herdman are RICS registered valuers for InSitu Advisory, based in Brisbane, Queensland.



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