

Insights into Mining

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Welcome to the first edition of Insight into Mining, a periodic e-newsletter focused on topics relevant to the Mining Industry. For today's mining companies, dealing with the complexity of the many challenges facing the industry has become a way of life.

KPMG's mining practice is committed to the industry and will periodically publish a series of insightful articles authored by leading KPMG Mining professionals and advisors. If you have any questions, please contact your local KPMG representative or [click here](#) for a list of KPMG's Mining leaders across the country.

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NAV Multiples

Unique to the mining industry, NAV multiples are commonly observed or applied in valuations. A NAV multiple is the multiple of the price of a mineral property as implied by the company's market capitalization or transaction amount to its net asset value ("NAV"). The NAV represents the net present value of the expected future cash flows of the mineral property based on certain inputs. A company with a NAV multiple that is greater than 1.0x is said to be trading or priced at a premium to its NAV and, conversely, one that is less than 1.0x is said to be trading or priced at a discount to its NAV.

It is said that the premium relates to "optionality" and other more intangible factors including, for example, a strong management team. Also, many would say that a multiple less than 1.0x implied by the company's market capitalization is not reasonable and thus that the mineral property is unfairly priced by the market. Accordingly, many sellers of assets are very reluctant to proceed with any offers below NAV.

Several questions often come to mind and are asked: What are the factors that can impact a NAV multiple? What is meant by "optionality"? Does a NAV multiple of less than 1.0x make any sense? Can a NAV multiple be analyzed?

In attempting to understand NAV multiples and responding to the questions posed above, it is first important to understand how NAV is calculated. Almost invariably, the expected future cash flows in a NAV calculation are based on the existing mine plan and a consistent discount rate across same/similar commodities. Also, a NAV calculation assumes that the

owner fully controls the asset and has unlimited access to any required capital to develop the property. Therefore, to the extent that any assumption in the NAV calculation differs from those made in the marketplace, the price or market capitalization may also differ. Such difference represents the premium or discount and is commonly expressed by way of a NAV multiple.

Below I address possible differences between assumptions used in a NAV calculation and the price implied by a company's market capitalization or transaction amount. Where possible, I have also attempted to quantify the implied difference in assumptions based on a simplified model that I have constructed. Also, I note that some of the NAV assumptions described below are based on generalizations of historic and current practice. Fortunately, there has been some progressive thought and further refinement of assumptions used in NAV calculations to more-closely resemble assumptions implied by market pricing. Unfortunately, however, the refinement of assumptions has been spotty and inconsistent across the industry. As such, the NAV and implied NAV multiple for the same property can now vary increasingly more significantly amongst analysts.

Additional Mineralization

Most properties tend to produce more than their existing mine plan. Higher than anticipated metal prices can lead to reduced cut-off grades and, thus, additional mineralization. Additional drilling can prove up resources and/or result in the discovery of new economically-mineable resources. Further, technological improvements can reduce costs and/or extract metal not previously possible. Loosely, this additional mineralization is commonly referred to as "optionality."

In isolation, such additional mineralization leads to a premium to NAV. The quantum of the premium is dependent on the market's expectation of mineralization beyond that included directly in the NAV calculation. Complicating the understanding of this premium, however, is the significant diversity in the industry on the nature and amount of mineralization included in a NAV calculation.

NAV calculations (also referred to as net present value or NPV) in technical reports, for example NI 43-101, detail the nature and amount of mineralization included in the model. The primary purpose of a NAV calculation in a preliminary feasibility study or feasibility study is to demonstrate the (positive) economics of the property's reserves. The reserves represent that portion of the measured and indicated resources that is economically mineable as demonstrated by at least a preliminary feasibility study. Companies may also publish a preliminary economic assessment which is a lower-confidence level study with the primary difference being the permissible inclusion of economically-mineable inferred resources.

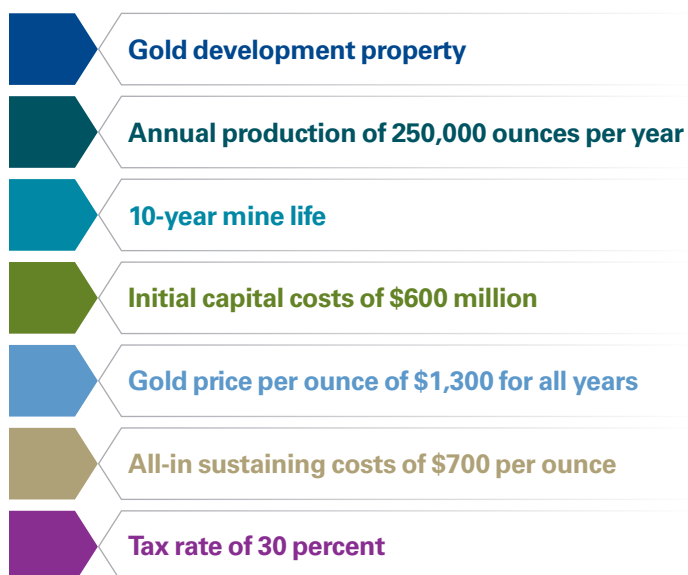
Outside of 43-101 reports, there is greater diversity. Corporate development groups and analysts unevenly include varying levels of mineralization. Many years ago, only reserves were commonly used in NAV calculations. Then, it became typical that the analyst community would include all reserves and some proportion of resources and would disclose such – for example, 60 percent of measured and indicated resources and 40 percent of inferred resources. Presumably, the percentages were to account for the increasing risk of converting the resources into reserves. Currently, most analyst reports do not disclose the nature and quantum of mineralization included in the NAV calculation.

This diversity in the amount of mineralization included in NAV calculations is not to say that anyone is necessarily wrong, but only to say that the resulting premium or NAV multiple is not directly comparable and may not be capable of being compared.



Assuming for a moment that there is consistent application in the industry, additional mineralization leads to an extension of the existing mine life and/or an expansion of existing production. As the additional mineralization represents an option to the company, the net present value of an extension and/or expansion is necessarily positive and, therefore, results in a premium to NAV.

To quantify the assumptions implied by the market as demonstrated by a NAV multiple, I have constructed an example based on the following existing mine plan assumptions:



These existing mine plan assumptions coupled with a standard industry real discount rate of 5 percent results in a NAV of \$350 million.

Now assume that the market expects an increase in the mine life of 2 years for an additional 500,000 ounces beyond the existing mine plan. Applying the same other assumptions as above, the market would exhibit a value of \$464 million and, thus, imply a NAV multiple equal to 1.33x (i.e., \$464 million/\$350 million). Again, the \$464 million representing a market value based on market assumptions including the additional mineralization (i.e., the 10 years per above plus an extension of 2 years), while the \$350 million, defined as the NAV, based on the existing mine plan assumption of 10 years.

Alternatively, assume an expansion of current production by 20 percent – again, for an additional 500,000 ounces. Based on the same assumptions above except for additional capital to expand the throughput of, say, 15 percent or about \$90 million, the market value would be \$443 million and imply a NAV multiple equal to 1.27x.

The magnitude of the premium expressed as a percentage of NAV will be largely dependent on the extent of additional mineralization, the timing as to when it will be produced and sold, the cost of any additional capital required, and the marginal cost to produce. It can be that the marginal cost to produce is currently higher than the assumed future metal price thereby indicating that the option to extend or expand is currently not in-the-money or economical (i.e., no intrinsic value), but that there is a reasonable possibility that metal prices can sufficiently increase in the future beyond the assumed prices to result in economically-mineable ore. This latter concept is known in the financial option world as “time value” and is necessarily positive. Time value is quantifiable using option-pricing models.

Discount Rate

The discount rate or cost of capital should represent the required rate of return that an investor would command given the risks inherent in achieving the expected future cash flows. However, NAV calculations most commonly use a real discount rate of 5 percent for gold properties and 8 percent for most base metals. Such rates are seldom adjusted for current market rates of return and investor sentiment.



More importantly, such rates are rarely varied, up or down, for relative country risk and relative project risk. (I say “relative” since presumably the industry standard rates reflect some standard level of country risk and project risk – although, how much is difficult, if not impossible to ascertain.) A development project in a risky jurisdiction should certainly command a higher discount rate than a producing property in a relatively less-risky domicile. Further, a property with lower quality resources should command a higher discount rate than a higher-quality property.

If the cost of capital that an investor requires is greater than the industry standard rate used in the NAV calculation, then the price of the property would theoretically trade or transact at a discount to its NAV. This is one of the primary reasons that the NAV multiple for a development company is generally less than for a producing property. Likewise, this is a key explanation as to why a company with properties in less-risky jurisdictions is often priced at a premium to a company holding assets in riskier parts of the World.

Taking the simplified example and holding all other assumptions constant, a discount rate of 8 percent would result in a market value of \$225 million and imply a NAV multiple equal to 0.64x (i.e., \$225 million/\$350 million). A discount rate of 10 percent would result in a market value of \$156 million and a NAV multiple equal to 0.45x. Given varying levels of country risk around the World, an additional 3 percent, 5 percent, or even greater is reasonably possible.

The magnitude of the discount expressed as a percentage of NAV will be positively related on a diminishing basis to an increase in the discount rate. Having said that, it is also observed that higher capital expenditures in early years, can mathematically somewhat mute the effect of a higher discount rate.

Other NAV Assumptions

Although not expected to be as common as additional mineralization or discount rate, the market may be adjusting for other assumptions used in a NAV calculation in arriving at market value. For example, this might include assumptions on metal prices (excluding the impact of additional mineralization already reflected), operating expenses, and initial and sustaining capital.

Continuing with the simplified example and holding all other assumptions constant, an increase in all-in sustaining costs of 5 percent would result in a market value of \$302 million and imply a NAV multiple equal to 0.86x (i.e., \$302 million/\$350 million).

Resetting the assumptions again, an increase in initial capital costs of 20 percent would result in a market value to \$258 million and imply a NAV multiple equal to 0.74x. This potential scenario together with the increased risk surrounding a development property as discussed above are two of the key reasons that development properties generally exhibit lower NAV multiples than producing properties, and said NAV multiples can be less than 1.0x.

Market Capitalization Specific Factors

There are a number of other factors that may explain a NAV multiple of other than 1.0x implied by the market capitalization of publicly-traded companies.

1 The NAV calculation may simply be dated and not reflect assumptions at that immediate moment. For example, gold prices are continuously changing and impacting the share price. For practical reasons, NAV calculations are not updated contemporaneously, but rather usually only on quarterly basis by the analyst community. As such, small discounts or premiums may exist simply due to assumption timeliness.

2 Market capitalization is the product of the traded price per share and the number of shares outstanding. Through an exchange, shares are traded in small blocks. The traded price per share is thus said to represent the value of a minority interest and not necessarily a control or en bloc value of the company or property. Transaction take-over premiums over market capitalization have historically been in the range of 30 percent to 50 percent – with some periods exhibiting higher premiums.

3 The share price will consider all company-specific factors – some of which may not necessarily attribute to the underlying property. For example, assuming no changes in the assumptions and fundamentals of a company’s mining property, a company with a significant amount of debt may experience significant downward pressure on its share price as its debt nears maturity stemming from shareholder concern on its ability to refinance particularly in more challenging economic

times. On the positive side, a premium may exist in a company's market capitalization for a strong and proven management team for not only their ability to deliver on existing properties as promised, but also to identify, select, and develop new profitable properties. Further, a larger and/or more commodity-diversified company may command a relatively-higher NAV multiple. Quantifying the value of these company-specific factors in the market capitalization can be very difficult, but not impossible.

4 Applying to development companies in particular, the share price of a company also reflects the market's expectation as to the likelihood of the company proceeding with the project. Similar to the above, although a company may own and control a robust project, it may not have the funds necessary to develop the project. The probability of obtaining the necessary funds and any expected dilutive impact on the existing shareholders would be reflected in the company's market capitalization. Recall that a NAV calculation assumes unlimited access to any required capital to develop the property. In more difficult times and/or for companies with an already-challenged balance sheet, market capitalization and implied NAV multiples will be lower. At a high-level, if the market's expectation is that there is a 75 percent probability that the asset will be financed and constructed consistent with the timing assumptions in the NAV calculation, then the implied NAV multiple ignoring any other adjustments would be 0.75x.

Equity vs. Asset NAV Calculation

Further muddying the water in understanding and comparing NAV multiples are the components included in the NAV calculation. Above, I have kept it simple as the NAV includes only the mineral property. In practice, however, the NAV calculation and NAV multiple is often calculated for the company and includes all other assets and liabilities. For example, cash, investments, working capital, and debt are included in NAV as they are consistently reflected in the market capitalization or the amount a purchaser would pay for the shares of the company.

As entities have varying levels of other assets and liabilities from either time-to-time or as compared to its peer group, the comparison of NAV multiples inclusive of other assets and liabilities can be problematic. For example, assume two companies with an identical property with a NAV equal to \$350 million. Now assume that one company has debt of \$50 million and its market capitalization is \$475 million. Now assume that the other company has debt of \$150 million and its market capitalization is therefore (theoretically) \$375 million (i.e., \$475 million assuming \$50 million of debt less \$100 million in additional debt).

	A	B
Asset value	350	350
Debt	(50)	(150)
NAV after debt	300	200
Market capitalization	475	375
NAV multiple	1.6x	1.9x

As a result of the inclusion of debt or leverage, the implied NAV multiple is nearly 20 percent higher and one can see the issue surrounding meaningful comparisons.

Although not commonly observed or performed, the correction or alternative to the above would be to consistently calculate the NAV and NAV multiple based exclusively on the asset or mineral property by removing the entity's other assets and liabilities from both the numerator and denominator (i.e., this would be commensurate with an enterprise NAV). Following the same example, the NAV multiple would be the same at 1.5x regardless of the capital structure.

	A	B
Market capitalization	475	375
Add debt	50	150
NAV before debt	525	525
Asset value	350	350
NAV multiple	1.5x	1.5x

Closing Thoughts

So, if NAV does not necessarily represent the price of a mineral property as implied by the company's market capitalization or transaction amount, then why do most participants in the mining industry adopt this approach and consider assumption differences largely through the NAV multiple? Why not reflect market assumptions directly in the cash flows and the discount rate?

Here are some potential explanations for the practical use of the NAV multiple approach:

- Speaking about NAV multiples is akin to speaking about EBITDA multiples in other industries (with non-depleting assets). By definition, these multiples are largely indifferent to the size of the project or business. Also, industry participants are often reasonably knowledgeable of a possible range of multiples and can mentally categorize the relative richness of a valuation by the implied NAV multiple. For example, it is easier to both convey and understand that a mining company is being priced at a NAV multiple of 0.75x. Compare that to the alternative of saying that a mining company is being priced based on a gold price of \$1,400 in year 1, \$1,350 in year 2, \$1,325 in year 3, \$1,300 in years 4 and beyond, all known reserves and resources, an extra 2 years for expected additional mineralization, an additional contingency of 15 percent added to the capital cost estimate, a 12.5 percent discount (to account for various factors including development risk and country risk), etc. Having said that, the problem with the NAV multiple approach is that there is growing diversity in the assumptions used to calculate the NAV as discussed earlier in this article – so, maybe the detailed assumptions do need to be provided!
- For gold companies, a 5 percent real discount rate is almost always used for NAV calculations. Historically and perhaps for very well geographically-diversified operating mining companies, an overall real discount rate of 5 percent may continue to represent a reasonable rate of return required by investors. However, projects are becoming increasingly more difficult and/or located in more politically challenging countries. As such, it is more probable today that a one-size fits all real discount rate assumption of 5 percent is not a reasonable or sufficient return required by the market.
- Some would suggest that using a higher discount rate unfairly penalizes long-life capital projects and that an alternative would be to use a low discount rate coupled with a NAV multiple – that is, the NAV multiple approach. The issue is, however, why should 5 percent be necessarily used (i.e., why not something lower) and how does one justify the reasonableness of the selected NAV multiple?
- The industry knows that the individual market assumptions can be different than the assumptions included in the NAV calculation. However, they may not be willing or able to accurately reflect such assumptions directly in the model. Moreover, an analyst may not want to entice additional debate with a mining company on judgmental and/or difficult-to-determine NAV assumptions given the disclosure of such are available to the investor community.

This article hopefully provides some insights into the practical usage of NAV multiples and the questions posed above. In practice, I always suggest that as an alternative approach or as a test-check on the NAV multiple approach, that a company or investor explicitly use market cash flow assumptions and a market discount rate. More importantly, the alternative, more-explicit approach helps to understand the components discussed in this article and where value truly lies in a project and company!

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