THE LONG PULL: An 80/20 Mining Stock Analysis Primer

I've spent the past eight months studying the metals and mining industry, including copper, gold, silver, and PGMs.

There's *so much* to learn in this space. The amount of information in a mining stock pitch deck can be overwhelming (all those drill results and geological surveys).

But here's the good news.

I've distilled everything I've learned in the last eight months into an **80/20 Mining Stock Analysis Primer.** Like most things in investing, this guide provides the key 20% of the information that gets you 80% of the way there on an idea … and includes mining stocks.

This report highlights the Three Big Themes you must know to analyze and value any mining stock, from developer to producer:

> ➢ **NPV, IRR, & Capex Analysis**
> ➢ **Resources & Reserve Analysis**
> ➢ **Company Quality Scorecard**

We'll then use this primer to analyze Minera Alamos (MAI.V).

I hope you're excited. This is something I wish I had when I started eight months ago.

Let's get after it.

Primary Knowledge: My Favorite Mining Stock Resources

Before we dive into the report, I want to share my favorite mining stock resources.

Books

> ➢ *How To Invest in Gold & Silver,* Don Durrett
> ➢ *PAYDIRT,* Jeff Clark
> ➢ *Mineral Exploration and Mining Essentials,* Robert Stevens
> ➢ *The Mining Valuation Handbook,* Victor Rudenno

Websites

- [CEO.ca](CEO.ca)
- Mining.com
- FT.com Commodities

Podcasts

- Northern Miner Podcast
- Money of Mine
- Value Hive Podcast :)

Most of the 80/20 Report comes from material in *How To Invest in Gold & Silver*. Thanks, Don!

Alright, now that you've bookmarked these resources, it's time to dive into our 80/20 Mining Stock Analysis Report, starting with NPV, IRR, and Capex.

Theme #1: NPV, IRR, and Capex Analysis

I assume you already know what NPV, IRR, and capex mean. What matters is how professional mining stock investors use these metrics.

Let's start with NPV.

NPV: Know Your Ratios

A mining company's net present value (NPV) is the discounted cash flow from the mine at an assumed metals price, cash cost (how much it costs to get the metal out of the ground), and a discount rate.

At a fundamental level, NPV is the net between a company's average sales price and its all-in-sustaining cost (AISC). The difference between the two is a pre-tax cash flow.

You want an NPV that is **significantly higher** than the current market cap.

This could be due to higher metal prices, a low-cost mine (usually found in developing countries), or both.

Don Durrett suggests a **5-to-1 ratio** or $5 in total NPV for every $1 in market cap.

The 5-to-1 ratio doesn't offer insight into the **quality** of the project or asset. It just tells us how cheap the stock trades relative to that asset. This is a subtle yet significant distinction.

Then there's IRRs.

IRR Analysis: Think Like A Banker

I'm stating the obvious, but you want **high** IRRs. My rule is that I want 25-30% IRRs mininum.

I prefer 25-30% IRRs for two reasons. First, it shows me that the project has **good** economics. The payoff for the capex will be worth it, and the project makes sense to build.

The other reason is that financing a higher IRR project is more manageable. Banks or royalty companies don't want to lend millions of dollars to a project with a 15% IRR when they can get 5% in a money market account. Why would they risk capex blowouts, geographic issues, and political turmoil for that?

I want to mention one thing before discussing capex analysis … **Pay attention to the metal price assumptions in these calculations!**

Metals price assumptions provide two critical insights into a company:

1) It tells you whether a management team is conservative or aggressive (always opt for conservative)
2) It tells you that a company could be significantly undervalued at today's metals prices (if it's a 30% IRR at $1,600 gold … what is it at $2,000?)

Onto capex.

Capex Analysis: Know Your Ratios

Mines require initial and sustaining capex to produce metals. Let's focus on the initial capex for now.

The best mining investors I know **buy projects/assets with an NPV at least 2x higher than the initial capex requirement**.

This makes sense.

Put yourself in the shoes of a project finance manager. You don't get fired for lending money to a gold mine with low initial capex and high IRRs. You get fired for loaning $100M to a project with a $110M NPV discounted at 5% using aggressive metal price assumptions.

The investment should be worth the risk.

Chop wood, carry water…

The higher the ratio between NPV and initial capex, the greater the potential reward. This also shows that the project has low cash/all-in-sustaining (AISC) costs.

There's also an element of size risk to capex. You'll see junior developers with $50M market caps release PFS showing massive IRRs and NPVs; then you look at the capex, and it's $1.2B … there's *no chance* that a company that small will build that project.

And if they try, they'll dilute their shareholders into oblivion in the process.

That is unless the mine life is long enough.

Mine Life: Focus On 10YR Mine Life

You want to own companies with long mine lives. **Ten years minimum is ideal.** If a company releases a study with a mine life <10 years, find out why.

Sometimes, they want to get into production quickly and use the cash flows from the initial years to expand their resource base (i.e., prolong the mine life).

Recapping Theme 1

- ➢ **NPVs** 5x higher than the current market cap
- ➢ **IRRs** at 25-30% or higher
- ➢ **Initial Mine Life** of at least ten years
- ➢ **Capex** should be <0.5x the NPV

Theme #2: Resource Valuation

The basic idea is that there is a certain amount of metal in the ground and that metal has *some* value. That value depends on the probability of extracting and producing the metal.

There are three levels of resource "accounting" (descriptions paraphrased from Don's book):

- ➢ **Inferred Resources:** These are the earliest estimates of a resource endowment based on preliminary drill results. The **"43-101" report includes inferred resource numbers.**

Inferred Resources are the **least reliable** resource estimates. Further drilling is required to confirm geology quality, and at this point, we still don't know the economics of extracting those results.

In his book *PAYDIRT, Jeff Clark* gives Inferred Resources a 10% likelihood of extraction.

> ➢ **Measured & Indicated (M&I):** Resources that could be extracted under a mine plan. You'll see the phrase "economically minable" here. M&I takes inferred resources and adds details like tonnage, grade, densities, and other physical factors. It creates a clearer picture of what's down there.

M&I resources are "bankable." In other words, you can assume that the company will eventually mine them. Jeff Clark assumes a **~50-70% probability for Measured** and a **25-50% probability for Indicated reserves.**

> ➢ **Proven & Probable Reserves (P&P):** Resources that will most likely get mined profitably based on Preliminary Feasibility Study results.

Clark gives P&P a **70-90% probability of being extracted** during the initial mine life plan.

Here's a simple breakdown of resource and reserve definitions from Jeff's book (see below).

Reserves		Resources		
Proven	Probable	Measured	Indicated	Inferred
90% or more likelihood to be extracted	70-90% likelihood to be extracted	50-70% likelihood to be extracted	25-50% likelihood to be extracted	10% likelihood of extraction
Have had full feasibility studies		"Reasonable but not certain prospects for extraction."	Has limited geological evidence and sampling	Evidence is sufficient to imply but not verify ounces or grade; is not counted in Resource calculations.

What's the best one to use? I prefer a blend of P&P and M&I for a total resource estimate. Something like 80-90% of stated P&P reserves plus 40-50% of M&I resources.

<u>I want conservative estimates in my valuation.</u> If a mining stock trades at a discount to its P&P reserves, it will also trade at a substantial discount to M&I.

That's good, but what are good heuristics for identifying and comparing relative cheapness?

Chop wood, carry water…

Don provides three valuation methods in his book.

Valuation Method 1: Market Cap Per Resource Ounce

This method determines how much you pay for ounces in the ground. Don calls this method *"the most important valuation for identifying cheap stocks."*

Let's use Barrick Gold (GOLD) as an example. Here's their latest resource and reserve data from 2023.

Proven & Probable:	63.75M
Measured & Indicated:	85.51M
Inferred:	14.88M
Reserves & Resources:	100.39M

Let's input these figures into our formula to get total resources: (63.75 * 0.90) + (85.51 *0.5) = **100.13Moz**

Next, we divide GOLD's market cap by our resource estimate: $30B / 100Moz = **$300/oz.** You're paying ~$300/oz for GOLD's reserves and resources.

From 2012 to 2021, gold miners paid ~$186/oz for gold reserves (see below).

Annual acquisitions of gold in reserves, reserves & resources, 2012-21

Year	Average market gold price ($/oz)	No. of deals	Deal value ($M)	Gold in acquired reserves (Moz)	Price paid for gold in reserves ($/oz)	Gold in acquired reserves & resources* (Moz)	Price paid for gold in reserves & resources ($/oz)
2012	1,669	9	5,316.3	37.6	141.26	85.8	61.94
2013	1,411	10	6,041.5	55.0	109.80	121.8	49.59
2014	1,266	9	6,137.9	31.2	196.53	82.7	74.26
2015	1,160	8	9,481.5	63.7	148.90	196.6	48.23
2016	1,248	8	2,193.0	20.3	107.89	40.0	54.80
2017	1,257	12	3,182.7	38.8	82.08	95.0	33.51
2018	1,270	9	9,361.6	34.9	268.03	85.7	109.18
2019	1,393	12	18,679.2	97.6	191.37	223.0	83.78
2020	1,771	16	13,144.1	58.4	225.22	139.1	94.47
2021	1,800	7	14,479.9	33.2	436.41	84.5	171.45
Totals/averages		100	88,017.7	470.7	186.98	1,154.2	76.26

Data as of June 23, 2022.
* In deals with a minimum of 1 Moz in reserves.
Sources: S&P Global Market Intelligence; London Bullion Market Association

GOLD is a major gold producer. So, we shouldn't expect them to trade at massive discounts to historical M&A averages.

Anything under $ 200/oz is relatively cheap and worth exploring.

Valuation Method 2: Share Price Valuation by Resource Ounce

The following method takes the total resource estimate and divides it by the fully diluted share count.

GOLD shareholders own 100Moz / 1,755M or **0.05oz of gold per share.**

I like this valuation method for two reasons. First, it shows how large (or small) a company's reserves/resources are… the larger, the better.

Second, it reveals companies with shareholder dilution problems. A company could have a goliath resource, but if it dilutes shareholders into oblivion, the per-share value of that resource will be reduced.

On share count … my threshold is <500M fully diluted shares outstanding for North American businesses. Australia, I will go up to 700M.

Valuation Method 3: Resource Valuation to Market Cap

Chop wood, carry water…

This final valuation method takes the resource amount and multiplies it by the spot metal price. From there, it divides that amount by the company's market cap. This shows what percentage of the market cap is valued (or covered) by its resources.

Let's try it for GOLD.

➢ Resource Value: 100Moz * $2,400 = $240B in resource value
➢ Market Cap: $30B
➢ Percent of market cap valued by resource: **$30B / $240B = 12.50%**

Don prefers companies that have a 10% or lower Resource Valuation to Market Cap.

Recapping Theme 2

Up until this point, we've learned what makes a project economical, viable, and attractive to investors and bankers.

More importantly, we've learned how to quickly identify what projects are attractive based on a few key factors and metrics.

We also learned to value a company's reserves and resources using conservative estimates and simple calculations.

➢ **Market Cap Per Resource Ounce**
➢ **Share Price Per Resource Ounce**
➢ **Resource Valuation to Market Cap**

Consider this the initial filter in your mining stock screener. If the above metrics look good, you're ready to move on to the final theme: the company quality scorecard.

The scorecard takes the inputs from the abovementioned metrics and adds specific company details enabling us to assess any mining company.

Here's what our first two themes look like for Minera Alamos (MAI.V).

Minera Alamos (MAI.V) 80/20 Analysis

MAI.V is a small-to-mid-tier gold producer in Mexico. The company will produce ~25,000oz over the next twelve months and plans to expand to 80Koz by the end of next year.

I had CEO Doug Ramshaw on the podcast two weeks ago. He reminds me of IDR's John Swallow, aka the real deal. Give it a listen here.

Let's start with our NPV, IRR, and Capex Analysis.

You can usually find all this information in a company's latest investor presentation.

Theme 1: NPV, IRR, and Capex Analysis

MAI currently has one producing asset (Santana), one permitting (Cerro de Oro), and one developing (La Fortuna).

Santana (mine)	~15 Koz Produced to Date	~200 Koz Indicated	10 M Low Capex	Sub $900/oz Cash Costs in 2022
Cerro de Oro (permitting)	~58 Koz Annual Production	~790 Koz Inferred	28 M Low Capex	$873/oz AISC per 2022 PEA
La Fortuna (development)	~50 Koz Au Eq Annual Prod.	~300 Koz Measured & Indicated	30 M Low Capex	$440/oz AISC per 2018 PEA

Since Santana is producing, we'll focus on Cerro de Oro and La Fortuna for this portion.

Here's Cerro de Oro's NPV, IRR, and Capex analysis slide (see below).

Chop wood, carry water…

Cerro de Oro **PEA Summary**

MINERA ALAMOS INC.

After-Tax

NPV (5%)	US$150.5 million
IRR	111%
Payback Period	11 months

Summary

Ave. Annual Production	58,400 oz gold
Pre-Production Capital	US$28 million (including 30% contingency)
Sustaining Capital	US$14.7 million
LOM Average AISC	US$873/oz
Mine	8.2 years
Mining Rate	20,000 tpd
LOM Grade & Recovery	0.37 g/t Au (68% recovery)
LOM Strip Ratio	0.3:1 (waste to mineral)
Gold Price	US$1,600/oz
FX Rate (MXP/US$)	20

111%
Strong IRR After-Tax

US $28M
Modest Capital Requirements

11 Months
Excellent After-Tax Payback Period

Notes:
1. "AISC per ounce" is a non-GAAP financial performance measure with no standardized definition under IFRS.
2. Base case price for gold was assessed using long term consensus pricing factoring in a modest discount against the average of available bank and brokerage firm estimates.
3. Life-of-Mine Averages exclude partial production in year 9
4. LOM average combined grade of run-of-mine ("ROM") and crushed material sent to leach pads Cerro de Oro Economic Summary PEA Cautionary Note: Readers are cautioned that the PEA is preliminary in nature and there is no certainty that the PEA results will be realized. Mineral resources are not mineral reserves and do not have demonstrated economic viability. Additional work is needed to upgrade these mineral resources to mineral reserves.

We have all the information we need to run our calculations:

➢ **NPV:** $150.5M (below the current market cap)
➢ **IRR:** 111% (above our 25-30% threshold)
➢ **Initial Capex:** $28M (below our 50% of NPV threshold at 18%)
➢ **Mine Life:** 8.2 years (below our ten-year threshold)

So it's a mixed bag. But let me show you why I love this project.

Notice the gold price assumption in the PEA … $1,600/oz. Gold is well over $2,300/oz today.

Then check out the AISCs of $873/oz. Anything below 2/3rds the price of gold is low. $873/oz is **~38% of the price of $2,300 gold.**

This translates into 111% IRRs, one of the highest IRRs from a project I've seen this year. And that's at $1,600/oz gold!

We can run the same exercise for MAI's La Fortuna asset (see below).

Chop wood, carry water…

La Fortuna PEA Economic Summary

MINERA ALAMOS INC.

After-Tax

NPV (7.5%)	US$69.8M
IRR	93%
Payback Period	11 months

Summary

Ave. Annual Production	43k oz Au, 220K oz Ag 1,000 t Cu (50k oz AuEq)
Pre-Production Capital	US$26.9M
LOM Average AISC	US$440/oz
Mine	5 years
Mill Throughput (avg. tpd)	1,100
Mill Grade & Recovery	3.68 g/t Au (90% recovery)
Gold Price	US$1,250/oz
Silver Price	US$16/oz
Copper Price	$5,725/tonne
FX Rate (CDN$/US$)	0.77

Notes: 1.AuEq–gold equivalent ounces. 2."AISC per ounce" is a non-GAAP financial performance measure with no standardized definition under IFRS. 3.Base case prices for gold, silver and copper were assessed at values approximately 2%7% below the 3 yeartrailing average prices for each of the metals and below the majority of the publicly available forward lookingestimates available as of July 2018. 4.Further details are provided in the Company's press release dated August 16, 2018. La Fortuna PEA Economic Summary PEA Cautionary Note: Readers are cautioned that the PEA is preliminary in nature and there is no certainty that the PEA results will be realized. Mineral resources are not mineral reserves and do not have demonstrated economic viability. Additional work is needed to upgrade these mineral resources to mineral reserves

93%
Strong IRR After-Tax

$1,250/oz
Prudent Gold Price
Assumption in USD

11 Months
Excellent After-Tax
Payback Period

➢ **NPV:** $70M (below the current market cap)
➢ **IRR:** 93% (above our 25-30% threshold)
➢ **Initial Capex:** $27M (below our 50% of NPV threshold at 39%)
➢ **Mine Life:** 5 years (below our ten-year threshold)

Again, some aspects of the project (mine life and NPV) don't meet our initial threshold. However, look at the inputs.

La Fortuna's PEA uses $1,250/oz gold. **Gold is 84% higher** than that assumption.

And look at the AISCs … $440/oz is ~19% of the current gold price, well below the 2/3rds threshold for a low-cost operator.

You might say, *"Yeah, but MAI did that study in 2018. Costs have risen since then."* And you'd be right. But costs haven't risen as high as gold (84%). Not to mention, these are "simple" open pit heap leach mines, which are naturally lower-cost.

Theme 2: Resource Valuation Methods

Let's use the preferred Market Cap Per Resource valuation method for MAI.

Market Cap Per Resource Ounce

➢ Market Cap = $130M

- ➤ Total Resource Ounces = (200K * 0.90) + (790K * 0.25) + (300K * 0.5) = 527.5Koz
- ➤ Market Cap Per Resource Ounce = **$246/oz**

This looks high, and it is at >$200/oz. But again, we must ask why. Doug Ramshaw mentioned on the podcast that MAI wants to start small and build its resources with cash flow from operations.

They're choosing to start small to protect the balance sheet, which makes sense.

Now we can move on to the third theme … **Quality Scorecard.**

Theme 3: Quality Scorecard – Bringing It All Together

The Quality Scorecard uses ten inputs, each with a score ranging from 1-5 (1 = worst, 5 = best).

I stole this scorecard from Don Durrett's book and put it into an Excel spreadsheet (see below).

Company Name	Ticker	Balance Sheet	Costs	Exploration Potential	Management	Ownership	Location	P/P/P	Share Structure	Risk	Upside	Total Score
Idaho Strategic	IDR	4	4	4	5	4.5	4.5	3	5	4	3.5	83.00%
Andean Precious Metals	APM	4	3	3.5	5	5	3.5	3	5	3	4.5	79.00%

You can download the spreadsheet here.

Let's examine the most critical questions for each input and the answers for MAI.

Balance Sheet (4/5)

- ➤ *Does the company have a lot of debt? If so, what is the interest rate on that debt? How much does FCF go to paying down debt?*
  - ○ **What I want is** little to no debt.
- ➤ *How much cash does the company have? Is it enough to get them through a drilling program if they don't have positive cash flow?*
  - ○ **What I want:** high cash balances relative to any debt … ideally net cash.

MAI … $6M in net cash on the balance sheet with $25M in financing available for its Cerro de Oro mine.

Costs (5/5)

- ➤ *What are the company's cash costs and AISCs? What is that percentage of today's gold price?*
  - ○ **What I want is** bottom-tier cash and AISC producers.
- ➤ *How have costs trended over time?*

Chop wood, carry water…

- ○ **What I want is for** costs to grow less than metal price appreciation.

Due to Mexican jurisdiction and open pit heap leach extraction methods, MAI is one of the lowest-cost producers I've seen.

Exploration Potential (5/5)

- ➢ *How big is the company's land package?*
- ➢ *Do they have easy access to expanding their existing operations?*
- ➢ *Are they at the beginning or end of their resource growth estimate?*
    - ○ **What I want is** a company that can expand existing production at low costs and has ample land package for exploration upside.

MAI … the company aims to go from 25Koz/year to 140Koz/year within 3-5 years.

Management (5/5)

- ➢ *What is the history of the management team?*
- ➢ *Have they done this before and had success?*
    - ○ **What I want**: a management team with a history of success doing what they say they will do … ideally with 1-2 successful exits in prior ventures.

MAI … Doug Ramshaw has done this before. He founded Castle Gold and took it from a $7M initial capex build to a 100K+oz producer that he sold to Argonaut for $130M.

Ownership (5/5)

- ➢ *How much stock does the management team own?*
- ➢ *How did they acquire that stock (options or market purchases)?*
    - ○ **What I want:** a management team that owns 2-5%+ of the company that bought their shares on the open market.

MAI … Doug owns 2% of the company, and he bought the shares on the open market with his money.

Location / PPP (2.5/5)

- ➢ *How many ounces are in the ground?*
- ➢ *What percentage is inferred/M&I/P&P?*
- ➢ *What is the ore grade?*
- ➢ *Where is it located?*
- ➢ *What is the potential resource size?*
- ➢ *How much of the location do they own?*

➢ *Is there existing infrastructure?*
  ○ **What I want:** Tier 1 or 2 jurisdiction, decent grades (0.5g/t for open pit or 1g/t for underground gold), cash costs 1/3rd of the current gold price, 100% owned, with the mine close to existing infrastructure.

MAI … I gave them 2.5/5 because Mexico is considering [banning open pit mining](). That would be bad for MAI.

Share Structure (4/5)

➢ *How many share classes are there?*
➢ *How many options did the company issue?*
➢ *What's the fully diluted share count versus current shares outstanding?*
  ○ **What I want:** One share class with minimal options and warrants and sub 500M shares outstanding

MAI … has <500M shares outstanding with 26M in options.

Risk (3/5)

➢ *What is the current political/jurisdiction risk for the mine?*
➢ *Are there any issues at the mines? Is there anything that could impede production and impair cash flow?*
➢ *Where is the company in its capex cycle? Are we investing ahead of a large capex build?*
➢ *Does the company have low enough cash costs to endure a metals price pullback?*
  ○ **What I want:** Either a low-risk company with decent costs and upside potential or a higher-risk company with low costs and massive upside

MAI … again penalizing the company for Mexico's pending open pit mining ban. That said, MAI is cheap enough and has low enough cash costs to make it worth the potential risks.

Upside (5/5)

➢ *How much cash will the company generate over the next 12-18 months?*
➢ *What percentage of its market cap will it make in cash during that time?*
➢ *How much cash does the company make assuming bullish metals prices?*
➢ *How much can we make if the company hits its production growth targets?*
  ○ **What I want:** 30-50% FCF yields at current metals prices with 75-100% yield targets at bullish metals prices

MAI … this is where things get interesting. The company has a path to 80Koz/year in annual production at <$1,000 AISCs. Let's do some quick math.

80Koz sold at an average price of $2,300/oz with ~$1,100/oz in AISCs (assuming some cost inflation) gets us $1,200/oz in per-ounce cash flow or **$96M in annual cash flow.**

MAI has a current market cap of $130M (73% yield).

That does not include the company's La Fortuna asset, which could increase production to 140Koz/year at ~$1,200 AISCs.

The result is an 83/100. Here's how MAI.V ranks against our portfolio mining companies (see below).

Company Name	Ticker	Balance Sheet	Costs	Exploration Potential	Management	Ownership	Location	P/P/P	Share Structure	Risk	Upside	Total Score
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Andean Precious Metals	APM	4	3	3.5	5	5	3.5	3	5	3	4.5	79.00%
Minera Alamos	MAI	4	5	5	5	4.5	2.5	3.5	4	3	5	83.00%
Foran Mining	FOM	3.5	3	5	4	4	4	3	3	3	5	75.00%
Alphamin Resources	AFM	5	5	3.5	5	3	1	3	4	1.5	5	72.00%

That makes MAI.V an excellent candidate for a portfolio position.

Conclusion: The Resource I Wish I Had

I hope you enjoyed this 80/20 Mining Stock Analysis Primer. As I mentioned, I wish I had this when I started analyzing mining stocks.

There are books you can read on these subjects. However, the author takes 30,000 words to say something that should take 3,000 words at most.

Mining is a complex industry, but it's also a simple industry that follows the Pareto Principle. 20% of the information on any mining stock gets you 80% of the way there.

Apply what you've learned here to whatever mining company you find interesting.

Ask questions. Our collective has smart people (Will Thomson is a mining wizard) who would love to help you.

Macro Ops is about perfecting the craft of learning and investing. What better way to do that than learning about an industry like mining?

Until next week,

Brandon

Chop wood, carry water…