Brent Cook's
Exploration Insights
Turning Rocks Into Money

Fatal Flaws in the Junior Mining Sector
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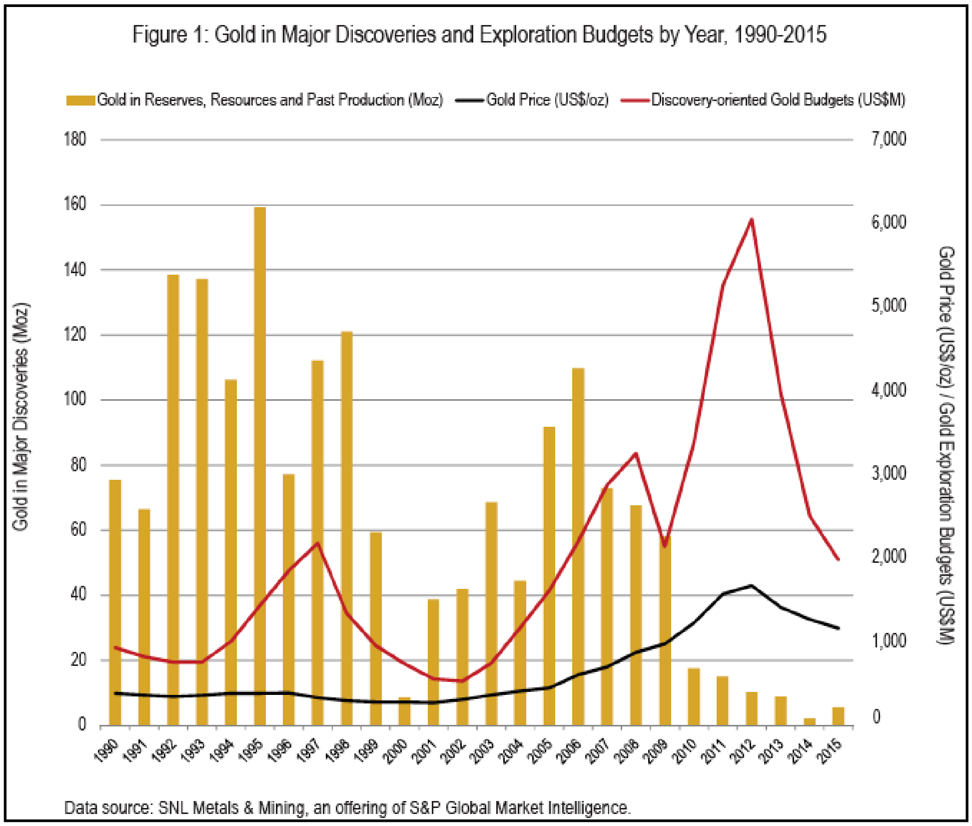
Question: What do Shakespeare's plays have in common with investments in junior mining?

Answer: Lots of tragic outcomes.

Most of the protagonists in Shakespeare's plays had tragic or *fatal flaws*, not unlike some projects being promoted by certain junior mining companies.

Our investment thesis for selecting junior mining companies involves identifying the *rare* quality (economic) projects available today and unmasking any potential fatal flaws (if they exist) early on, rather than chasing metal-price leverage or optionality plays managed by companies with marginal projects.

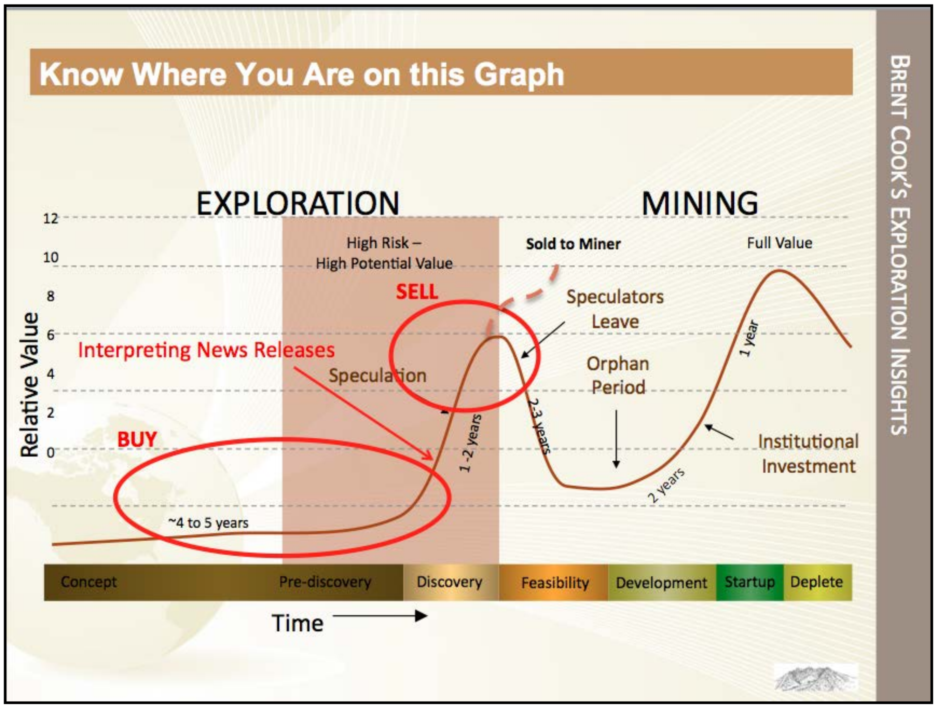
In our experience, quality projects are more likely to garner an M&A bid because they are in short supply due in part to falling budgets for grassroots exploration programs, Fig. 1. Conversely, owning companies with uneconomic to marginal deposits is no more than a bet on positive market sentiment and rising metal prices. These plays require almost daily reassessment of random factors that are beyond an investor's control, such as global economic and/or geopolitical uncertainty.



(Fig. 1: Major gold discoveries and exploration expenditures, *Source: SNL Metals & Mining and S&P Global Market Intelligence*)

Know where you are on this chart

The following chart is a highly valuable tool for speculators investing in the junior mining sector, Fig. 2. At the start of an exploration play, it is never clear where (or if) a fatal flaw will turn up. Inevitably, many early stage “discoveries” generate considerable share price appreciation as results suggest the possibility that company XYZ is on the path to an economic (real) find.



(Fig. 2: Junior mining cycle: Where you should buy and sell, *Source: Lassonde and Exploration Insights*)

As the project moves forward, the company releases increasingly detailed technical data. This is the point where things can start to go wrong and potential fatal flaws surface. It is also the period during which an investor can make a substantial gain on a failed project *if* time was taken to evaluate the company's news in the context of the likely capital and operating costs of the project and it was possible to identify the flaw or flaws ahead of the crowd.

Mining project risk assessment chart

To be able to identify flaws on a project, a useful tool is a *risk matrix*. Each of the potential risks a project could face is tabulated, Table 1, and graphed on the matrix as a function of its impact versus the probability of its occurrence. The matrix is then colored like a heat map, with the reds representing risks with a high probability of occurrence and a significant negative impact on the project. These hot spots are what we call *fatal flaws*.

Impact →	1	2	3	4	5
Probability ↓	Negligible	Minor	Moderate	Significant	Severe
(81%-100%)	7	**5**	7	2	2
(61%-80%)	7	9	14	4	4
(41%-60%)	8	6	9	**6**	7
(21%-40%)	15	**6**	8	6	5
(1%-20%)	11	6	5	7	7

PROJECT THREAT MATRIX

(Table 1: The heat is on, *Source: www.vue-matrix.com*)

There are literally thousands of junior mining companies vying for our attention and money. It is, therefore, imperative that they provide us with all the information needed to make an informed investment decision. To help us in this process, we created a chart that shows the majority of sources of information we rely on and the degree of success we might achieve in finding a fatal flaw or flaws by using one or more of them, Table 2.

Source of information	Risk				
	Management - relevant experience - strategy - capital market	Technical - resource - mining - metallurgy	Execution - infrastructure - permitting - power/water/labor	Geopolitical - mining friendly - security	Financing - capex - working capital
Website	Good	Neutral	Neutral	Neutral	Neutral
Presentation	Good	Good	Neutral	Neutral-Good	Good
Financials/MD&A	Good	Neutral	Good	Good	Excellent
Technical reports	Neutral	Excellent	Good	Neutral-Good	Neutral
3rd party	Good	Good	Good	Good	Good
One on one	Excellent	Neutral-Good	Neutral	Neutral-Good	Excellent
Site visits	Excellent	Excellent	Excellent	Excellent	Neutral

(Table 2: Risk categories for a given project versus their source of information and the resulting probability of finding a fatal flaw or flaws, *Source: Exploration Insights*)

The screening process for filtering investment opportunities

We always begin our investigation by reviewing the publicly available data, a task often referred to as a desktop study. These sources include the company website and/or presentations, technical reports filed on SEDAR (System for Electronic Document Analysis and Retrieval), financials, and management discussion and analysis (MD&A).

If the company and the project pass this cursory assessment, we dig deeper into the geological setting, consult with industry colleagues, and do a background check on the management team. Providing the project is still looking good, we follow up with a one-on-one meeting with management and, finally, organize a site visit to complete our analysis.

For those inclined to conduct their own desktop study, a company's website is, by far, the best place to begin. The way the information is presented is critical: is the first image you see on the homepage a sampling crew, a drill rig on site, or a mining truck on the company's operation?

You should also make sure that:

- the company's share structure and financial status are laid out in detail. Without the full share count and working capital details there is no way to value its assets; it's like walking down a grocery aisle with no prices in sight;
- the company's presentation provides a good overview of what and where it is focused on and what it intends to find or mine; and
- the news releases provide all the information needed to evaluate the results. They should include plan maps with all the trenches, samples, and drill locations, including (and this is important) past results from previous operators—it is rare that a "promising" project hasn't seen previous work. Renaming and recycling old dog projects is a favorite game of junior mining promoters.

(Value of a one-on-one meeting)

Management risk—jockeys or horses?

The investors debate between supporting jockeys (management) or horses (asset) has been prevalent in the junior mining sector for decades. Unfortunately, given the high probability of failure, any investor will need to look for both a solid management team and a top-tier project.

When it comes to a potential M&A transaction, given the number of write-downs from the cycle, suitors are asking for more project de-risking prior to any potential transaction. A management team, which includes the executive and board members, must have the capacity to handle the de-risking.

An effective management team should have excellent technical skills backed by a previous history of success, relevant experience and capital market knowledge. A competent technical team with no capital market experience may execute a poor financing plan or sell the project too cheaply. A capital market-heavy management team may get involved in a marginal project with no hope of ever being built or acquired. Also, a management team with minimal insider ownership that considers the company a lifestyle choice is a sign the company is best avoided.

Some professionals look good on paper but are, in fact, unreliable, making speaking with management at conferences or by phone remarkably useful. During site visits it is possible to observe the interaction between management and the rest of the staff, and make sure everyone is aligned.

Technical risk—Getting the geology right is crucial

Searching for fatal flaws in the technical aspects of a project requires further due diligence based on public sources of information (National Instrument 43-101 compliant technical reports) and site visits. Getting the geology right is critical. The market has absorbed a number of failed resource estimates over the past few years due to wrongly interpreted geology and/or faulty metallurgy.

The mineralogy and stratigraphic-structural controls on mineralization of a deposit determine if and how the ore can be profitably mined (open pit or underground, dilution percentage, strip ratio) and processed (heap leach, milling free gold, or refractory).

Although grade is often touted as *king*, it is actually the *profit margin* that counts and the ability to payback the original capital investment. Note potential suitors would seek a quicker the payback for an asset located in a higher geopolitical risk jurisdiction.

Execution risk—Going big leads to bigger headaches

Significant execution risks revolve around proximity to infrastructure (or the lack thereof) and the ability to permit the project's development. If a company is exploring for or building a mine at the back of beyond of some tin-pot country, the upfront capital and capital cost escalation could kill an otherwise decent deposit. Large projects can be attractive from a volume perspective, but they tend to generate extensive footprints that also draw the ire of third party stakeholders.

Financing risk—Not a problem to fund G&A and exploration, but no bank debt if it's not feasible

Potential investors in advanced plays must consider a company's financial position, market capitalization, and ability to fund a project. The number of equity financings in 2016 suggests a recapitalization of the junior mining sector. However, the ability to put together a financing package for a marginal project (which includes bank debt) is still a significant hurdle.

Summary

The risks associated with any junior mining project are part of the package and can't be avoided. The onus is on the management team to develop a viable strategy for its asset and execute upon it while mitigating such risks.

All the protagonists of Shakespeare's tragedies had a *fatal flaw* that sealed their fates. In the case of a mining project, an extreme risk or fatal flaw has a high potential impact and an elevated probability of occurring (red zone on a risk heat chart), and it will likely end the project's chances of advancing, regardless of its management team's capacity.

Your ability to find fatal flaws ahead of the crowd is *the* critical element to profiting from imagined and real discoveries in the junior mining sector. By focusing on reality and discarding enchanted tales emanating from persuasive promoters you will do better over the long run.