The Ten Discovery Investing Factors

Introduction:

This tutorial will help you understand how to use the Discovery Investing Scoreboard (DiS). Over the past decade we have developed ten factors that explain most of the variation in discovery share prices. These factors will help you perform due diligence on micro, small and midcap discovery stocks. We have refined these factors and used them effectively in our discovery investing practice.

These factors are scored using vocabularies or word-scores that allow for your imprecise knowledge of the company. Human decisions are inherently based on imprecision. These vocabularies come with membership functions that reflect the imprecision of each word score. In your factor word-scores you will provide your future estimate of each factor along with its future importance. We incorporate risk in the factor model by allowing users to specify their subjective word-score estimates of "goodness" or "badness" as well as the importance of each factor. Individual company scores are then combined to form a Crowd Score for each company on a factor by factor basis. A final ranking or score is adjusted for the shape of the overall footprint of uncertainty.

It is very important for the user of the system to realize that any company does not have to score highly in every factor. The most productive use of system will result if you use full dynamic range of the scoring which means you might score some factors very low. Also important is the time series increase or decrease in a company's overall score. Finally the comparison of your score to that of the Crowd will have significant implications for your due diligence and analysis of the company.

Please remember that individually these factors may be positive at one point and turn negative in the future, or they may become increasingly positive. The time series evolution of scores from the factor model is critical to understanding the Discovery potential of the company. The ten factors may be scored in any order although we prefer to score two factors, management and world class asset potential first:

1) **Management / Board:** Track record, competence and execution ability in achieving the goals of the business plan.

2) **World Class Asset, IP and Technology:** best in class for the Asset, Intellectual Property or Technology.

3) **Asset Technology Potential / Immediacy:** global "game changer" character of the asset/IP/technology. Discovery possesses immediate impact, significant potential **or** innovative disruption capability.

4) **Company Diversification:** sustainable diversification to create discovery wealth or reduce discovery risk.

5) **Cycle and Catalyst Identification**: Identification of future events that may signal price changes and value / price equilibration. These include catalysts such as drill assays or results of clinical trials. Such events might also include cyclical market or sector recoveries, S-curve revaluation or recognition of behavioral bubbles in asset and share prices.

6) **Contrariness of Assets**: significant under or over market valuation of current asset / technology.

7) **Financial Soundness:** throughout the discovery process. The company should have access to capital markets, private equity funding or other sources necessary to sustain exploration and development to completion of the business plan. The company must capably manage share dilution within its financing constraints.

8) **Company's Stakeholder Relationships**: with shareholders, bondholders, money managers, customers, suppliers, local population and NGOs. They keep shareholders fully informed and aware of significant milestones.

9) **Percent Project Ownership (Project Control):** the company sets its own agenda and maintains ownership control throughout the value creation process. They control the project currently. They manage dilution effectively. Insider share ownership, friendly ownership, institutional ownership and percentage project control are positive and significant.

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10) **Investor Sentiment:** your views of a "broken" stock, or one that is revered by the market. Investors may have lost patience in the market, sector or the company. The company may be a rising or falling star that requires your reassessment. Your cognitive biases, given length of involvement, may be to sell. Should you stay the course?

Let's take a closer look at each of these factors.

1. Management / Board

There is no doubt that a good management team (with the emphasis on Team) can create value in an average project, while a dysfunctional management can destroy a world class project. When evaluating this factor we focus on the CEO, COO, CFO and the Chief Geologist, Chief Technologist or Chief Scientist and the overall "team" capabilities.

We value management teams with experience, those that have successfully made or developed discoveries and created shareholder value. Management's track record is of great importance in scoring this factor.

Management should have experience or access to financing, corporate structuring, mergers and acquisitions, due diligence reviews and access to Investment Bankers and fund managers as well as the brokerage community. The team must have a game plan that is feasible and complete, which lead to monetization or production and cash flows. Management must be aware of strengths and weaknesses of their project(s) and develop contingency plans.

As a company progresses through its Discovery journey changes in management are often necessary. This means that the company must have a Board of Directors that plays an active role in overseeing management goals and milestones, solving problems when they arise, including management succession. The Chairman's role is critical and his / her experiences and track record and capabilities are equally important.

However, we focus on the CEO. His ability to recruit the best team and board, negotiate with his publics and provide leadership and mentoring is critical. His understanding of when to terminate a project is paramount. His track record in monetizing and joint venturing projects, completing goals and focusing on his business plan in a timely fashion is critical.

It is crucial that the management team have direct, personal ownership in the company. Each member of the Board should own a relevant position in the company. Management and consultant options must be issued judiciously based on performance. Early financing rounds by management, family and friends should be at reasonable prices. Insider buying is an encouraging sign. Insider selling is a negative and requires a lower word-score.

You will input your intuition and perception of the elements discussed in this tutorial that you feel are relevant. The DiS software will query you on the importance of this factor (Very Important to Unimportant) and whether you consider this factor "Mandatory" or "Desired" in your analysis. The word-score and importance for Mandatory factors tend to have significant impact on the overall ranking of the company.

In a company's early life cycle the management factor may often be deemed Mandatory and hence will dramatically affect the company's score and rank. In later scoring updates the management factor may be desired but not mandatory as management proves its value.

One caveat is in order. This is not a complete list of desirable management characteristics in the Discovery space. You may find other aspects that influence your word-scoring of this factor. Such a complete list is beyond the scope of this short tutorial. When you score this factor you will be asked to word-score management on the following basis:

Very Poor - Poor - Somewhat Poor - Nominal - Somewhat Good - Good - Very Good

2. World Class Asset/ IP/ Technology:

World class means "best of class." In the natural resource world we seek extractive resources that include desired commodity type, high grade, economic and large tonnage potential, simple metallurgy, excellent infrastructure and location, low to moderate cap-ex and positive local relations. As exploration advances, the true character of the resource becomes increasingly evident, graded on a scale from **Very Poor to Very Good**. Classification of the asset from a resource (NI 43-101) to bankable feasibility will reveal whether it is of world class nature. Updating this factor will produce changes in the rankings and perhaps a trading strategy for the Discovery Company. Bio Technology, High Technology and Infrastructure Discovery stocks are scored similarly.

In Bio technology we assess the in vitro, pre-clinical and clinical progress to determine degree of world class character of the IP. Cancer discoveries are high in importance because of the visible, multi-billion dollar market for new cancer therapies. Work in immune system therapies that may be applied to Multiple Sclerosis, ALS, stem cell technology and diabetes also often have world class potential. It is the increased potential as discovery and development advances through the clinic that matters most.

Experts constantly reassess the nature of the discovery process is in the scoring of the discovery company. While BLM, Interior, EPA govern progress through the extractive exploration phase, the FDA is key to the biotech space. The word-scoring for this factor is identical to that for management discussed above:

Very Poor – Poor - Somewhat Poor - Average - Somewhat Good – Good - Very Good

3. Asset or Technology Potential and Immediacy: (Destructive Innovation Potential)

Factor 2, world class potential, relates to "best in class" projects. This factor relates to discoveries which are significant, industry-changing breakthroughs. Destructive Innovation occurs when faster, simpler, cheaper discoveries threaten markets. From rare earth innovations to renewable energy and medical advances, the speed of technological discoveries accelerates industrial change.

This factor is a unique characteristic of Discovery Investing. These discovery opportunities, often high technology (material sciences, Apple's iPad), natural resource discoveries or bio tech therapies, radically alter the economics, structure or existence of an industry. While they may or may not always qualify as "world class," they have impact beyond resource or therapy discovery.

Rare earth elements have value in alternative energy and military applications. They have supported "game changing" discovery relative to automotive and weapons design. We think bio tech discoveries in stem cell therapy and cancer are other examples. Such discoveries revolutionize industries and generate new supply chains. Rare earth elements continue to have near term impact on economics of many industries. These include renewable energy industries developing battery technology, wind and solar energy.

Discoveries in the products from large flake graphite resources are of interest. These include the revolutionary discovery of graphene, a flat monolayer of carbon atoms tightly packed into a two-dimensional honeycomb lattice. Its discovery is a basic building block for many graphitic materials. It can be wrapped into fullerenes, rolled into 1-dimensional nanotubes or stacked into 3-dimnesional graphite. It has applications that will impact many industries such as plastics, steel strengthening and thermal printing.

We score this factor based on the impact of the discovery, near term integration (immediacy), superior wealth creation potential or creative destruction capability. The factor is scored:

Very Low Potential/Immediacy Low PI Somewhat Low PI Average Somewhat High PI High PI Very High PI

4. Company Diversification.

Discovery Investing, particularly at the Incubator stage, is very risky. Therefore it may be appropriate for a discovery company to acquire several resource projects or, in the case of bio technology or high technology, to develop multiple product ideas or therapies concurrently. This factor is scored based on the company's degree of diversification and the degree to which it can be managed effectively.

Diversification should de-risk the discovery company. Should one product fail to materialize (an ore deposit not reach expectations) the company could continue development of other projects. Diversification at the discovery stage may be a two–edged "sword." At times it is a positive and at other times a negative influence on company's ranking.

Very Poor - Poor - Somewhat Poor - Nominal - Somewhat Good - Good - Very Good

5. Cycle and Catalyst Identification

This is a more powerful factor driving asset value and share price. Discovery Investing is unique in that every drill hole or clinical test result provides a catalyst for share price change. The timing of these events is predictable though the results are not initially. However in the extractive resource space once a resource has been developed through exploration and drilling considerable knowledge is gained and discovery risk is reduced.

There are also longer commodities cycles where the discovery company is favorably aligned with the catalyst and cycle.

Asset bubbles in a sector may, from time to time, develop. Since 2004 we have observed this phenomenon with uranium, silver, rare earth elements and several critical metals. We expect to see this bubble pricing in graphite and other metals as materials research develops new and disruptive applications. The standard bubble structure is the traditional "S curve" which admits to slow initial growth then exponential growth in price before reversion to a lower mean level. This is a behavioral phenomenon often referred to as a "Mystery / History" curve in extractive resources. We see it often in early exploration for natural resources, in bio tech and high tech announcements. These events serve as both buy and sell catalysts.

Very Poor - Poor - Somewhat Poor - Nominal - Somewhat Good - Good - Very Good

6. Contrarianess of Assets (Discovery Assets Significantly Under / Over Valued)

This factor has been previously named the "Contrarian" factor. It refers to the valuation of the discovery company's assets. Deep Contrarian companies are considered "very good" and should be purchased (all other discovery factors constant) while companies that are poor contrarian candidates should be sold. Obviously from time to time companies, sectors and industries will be bid to excess premiums to fair value and conversely companies will sell at excess discounts to fair value. Many companies are selling at excessive discounts to their value.

According to a recent Barron's article, disciplined independent analysis done under intense market pressure will inevitably be contrarian. But contrarianism is most powerful just at the moment of its greatest difficulty. This fact keeps it rare and valuable as its advantage is difficult to copy or arbitrage away.

Deeply contrarian companies should score well in this factor, while companies whose share price is already relatively high with respect to their asset value should score poorly.

Both Value and Growth investors may utilize this factor as a "mandatory" to increase the DiS score. Very often this factor is labeled Mandatory especially when the price levels of the shares are at extremes to asset values.

Very Poor - Poor - Somewhat Poor - Average - Somewhat Good - Good - Very Good

7. Financial Soundness / Sustainability / Dilution Management

(Balance Sheet and Income Statement Sustainability)

For a large part of their early life span Discovery companies "burn" cash. We classify all Discovery companies into **three sub-classes, Incubator, Mature and Legacy**. Each classification is less risky and more valuable as the discovery assets are developed. The vast majority of discovery companies fail in their Incubator stage before they are able to make sufficient progress in their discovery development. Even Mature discovery companies that have made significant discoveries continue to burn excess cash. Failure most often occurs because discovery companies exhaust their financial assets, share prices decline and shareholder dilution destroys value.

In assessing the balance sheet strength we look primarily for adequate cash levels relative to monthly burn rates within the context of the company's discovery plan and progress. Liquidity is key in this regard. This will lead to estimates of pending dilution. Furthermore there are times in the market when raising capital is difficult or impossible. Therefore we examine management's time based strategy in capital replenishment as well. If management (the CFO) has an accurate view of discovery financing needs an estimate of funds required can be developed. Management must know what will be required to achieve meet its business plan's objectives?

Discovery companies that can achieve production and cash flows are materially de-risked and at the high end of the Mature classification where sustainability is increased substantially and hence liquidity risk reduced. We also seek management that will opportunistically buy back shares to reduce dilution and increase shareholder value while simultaneously increasing ability to issue shares at higher values.

Very Poor - Poor - Somewhat Poor - Average - Somewhat Good - Good - Very Good

8. Company's Stakeholder Relations

The most common question I receive from Morning Note readership is, "What does this press release mean?" Executive in Discovery Companies s are often scientists, drawn from the ranks of: Geologists, Bio Chemists, Engineers and High Technologists. They are frequently poor communicators because they speak in non- phrases understandable only to their peers.

We like companies that answer the phone (for every investor) and companies that keep a list of all investors in order to keep everyone informed and companies that communicate on a regular basis, at least quarterly, by press release and a follow-up conference call. This **always** breeds investor confidence. We value companies that maintain up-to-date web site information and perform their own Investor Relations and seek to develop relationships with Investment banks, fund managers and brokers. Ideally companies should have a written Investor Relations plan and execute that plan. Customer relations are critical to many companies and relationships with NGOs, local and state governments, environmental groups and native peoples may be extremely important in the ultimate execution and completion of the business plan.

In scoring this factor we are wary of companies that promote results unduly or misstate facts. There are many more examples of companies that fail this important stakeholder relationship task and are discounted by the capital markets. In short, scoring this factor is an iterative procedure of looking for green or red flags.

Very Poor – Poor - Somewhat Poor - Nominal - Somewhat Good – Good - Very Good

9. Percent Project Ownership (Maintaining Control of the Discovery Agenda)

We like discovery companies that control their own destiny throughout the exploration / development program. This means that management can define and execute their discovery agenda. This will involve how the discovery company takes its dilution and to what degree will that dilution be minimized, timely and bearable.

Companies take dilution by common share issuance, preferred share or debt or in the ground. We tend to score this factor highly (70% to 80%) based upon low overhead, spending judiciously and minimizing share dilution. We watch warrant and options issuance strategy carefully. It can cripple investor value creation.

We like tightly-held companies till important discovery milestones are achieved. Management teams that can build and attract a friendly investing clientele are much more valuable. Management teams that can attract non-dilutive financing are rated most highly. There may be scenarios where companies are "carried" to production or to bankable feasibility by larger companies. This strategy must be evaluated very carefully in the Discovery process for full share value realization. We value projects that have tight ownership and 100% control of the asset by the Discovery Company till discovery process matures.

Less than 20% 20% to 30% 30% to 40% 40% to 60% 60% to 70% 70% to 80% Above 80%

10. Investor Sentiment (Your Behavioral Biases)

By its nature Discovery Investing requires patience. Discovery journeys may require a decade with many unforeseen challenges. This requires patience, courage and continued knowledge building using the DiS. Investors tend to lose patience and interest in "long-in-the-tooth" discovery opportunities or, more likely, to want to shift to other, newer, more exciting opportunities. Investors must determine if the company's shares are broken based upon behavioral biases such as impatience, anger or crowd biases.

Economist Gary Shilling contends that assets can remain out of crowd favor far longer than you can support their exploration and development. According to a recent Barron's article, the legendary Ben Graham observed that individuals' gains were not primarily influenced by intelligence or special knowledge, but by temperament.

> The economist and investor John Maynard Keynes emphasized that individual investment profits are largely determined by how investors behave at market tops and bottoms -- which is where price volatility concentrates, where sudden spikes occur, where the big investment mistakes are made.
>
> The huge losses from buying into popular asset manias near the top at high prices (with no safety margin in case of a decline) and the lost opportunities from selling temporarily unpopular but cheap assets at or near a bottom devastate long-term results because of the powerful effect of compounding, which multiplies the effect of large errors. Moreover, investors who suffer these losses are generally hurt psychologically and are often too gun-shy for months or years after to pursue even sensible rewarding risk-taking opportunities.

Professor Daniel Kahneman in his recent book, ***"Thinking, Fast and Slow,"*** contends that humans have two minds. He calls them System 1 and System 2. He says your mind's System1, *"operates automatically and quickly, with little or no effort and no sense of voluntary control."*

He notes that your mind's System 2, *"allocates attention to the effortful mental activities that demand it, including complex computations."* The evaluation of this factor forces the investor to use her mind's System 2 in the context of the DiS to avoid mistakes of her System 1 cognitive biases.

Very Poor – Poor - Somewhat Poor - Average - Somewhat Good – Good - Very Good