



? What is a Stock Screening Model?

Ever wondered how Research Analysts decide to pick a particular stock out of several thousand options? To achieve this, Stock Screening Models are built (typically in Microsoft Excel) where filters are applied to shortlist companies that 'seem' good, a thorough research follows before applying Valuation techniques (e.g. DCF, Comparables, replacement cost etc.) to come down to a 'Valuation Range'.

There are two approaches to do this:

- i. Top-Down (a.k.a. Economy-Industry-Company or EIC approach)
- ii. Bottom-Up (a.k.a. Company-Industry-Economy or CIE approach)

The phrases 'Top-Down' & 'Bottom-up' have different interpretations in varying contexts of use. However, in the parlance of stock selection they refer to 'Screening' i.e. 'Filtering' stocks based on Macro Economic or Company specific criteria respectively. The article focuses on the latter.

Also called: Stock Screening Model, Stock Selection model, Stock filtering model & Stock picking model

? Stock Screening: Underlying Principles

Stock screening must follow a 'Market based' approach, in a way – 'Hypothesis testing'. What we are trying to achieve is, to identify those stocks that may be good (as per what the market believes) but yet, gone unnoticed. The question is – what does the market believe? To answer this we may analyze past trends to see what kind of stocks have given the best returns and what were the factors common to them. Needless to say, such factors simply cannot be generalized as they may be affected by circumstances at that time. However, the hypothesis that they have truly gone unnoticed or whether they were deliberately avoided can be tested through 'back-testing'!

? Investment philosophies: What creates a philosophy?

Before we move on to creating & using stock screening strategies we must understand popular investment philosophies that drive the broader market. The Stock market attracts a varied variety of players each with –

- **Different backgrounds:** Investors may include HNIs relying on expert advice, qualified Finance/Investment professionals managing their own wealth or Institutional Investors
- **Risk appetites:** The investors above can be further classified into one having fairly low risk appetites to those with gambler like instincts (i.e. Punters)
- **Investment Horizon:** They may be further classified into short term and long term investors. Contrary to popular belief, not all long term investors seek low risk! Some long term investors hold 'junk' stocks (a.k.a. 'penny' stocks) speculating that sooner or later they will improve performance or will be acquired at a far higher price resulting in windfall gains!

Each of the above factors affects their perception of the market and hence the Investment philosophy.

For those who do not have a particular strategy, tend to track stocks held by – top performing Mutual Funds or successful investors like Benjamin Graham, Warren Buffet, Peter Lynch or our own home grown – Rakesh Jhunjhunwala... a philosophy in it's own right! However, irrespective of the investment philosophy they all share the same agenda - Maximizing wealth!

Theoretically, Investment philosophies may be broadly classified into –

i. Value investing

Value investing involves finding stocks that are undervalued as measured by fundamental performance. The principle behind the approach is that certain stocks despite having strong fundamentals have gone unnoticed by the market and hence trade at values lower than what they are actually worth. It could include investing in companies with high dividend/earnings/cash flow yields, low price to book multiple or low price to earnings multiple. The latter being the most popular!

ii. Growth investing

Growth investing is in fact quite the opposite. Followers of this philosophy believe that companies that grow at higher rates than the average within their peer sets must be bought. The rationale being, although such companies appear ‘overbought’/overvalued today, they are likely to improve/maintain their competitive advantage in the future. Thereby being undervalued!

iii. GARP investing

A crossover of sorts. Apparently, proponents of the Growth at a Reasonable Price (GARP) philosophy believe in finding stocks that have a high ‘expected growth’ but yet have comparatively lower multiples, and are thus cheaper. We believe many investors today intentionally or otherwise follow the approach.

? What’s the relationship between Investment Philosophy and Stock Screening?

To ensure that the goals of the investor are aligned with the portfolio, the analyst must create filters to suit the Investor’s Philosophy. For e.g. a Value investor may be more interested in a steady stream of cash flows in terms of dividends, for which a dividend yield and dividend payout ratio filter may be applied. On the other hand, a growth investor may be willing to take a higher risk and go for stocks that tend to trade on higher P/E multiples.

? How is a stock screening model made?

Typically, the Analyst goes through the following steps while building a stock screener in Microsoft Excel:

Step 1 – Start out by extracting data from a database (e.g. Bloomberg, Thomson-Reuters, Factset, CMIE, Capitaline etc.)

Step 2 – Calculate relevant ratios (instead of using the ones given by the database!)

These may include metrics within these 10 categories:

- i. **Growth:** Last 3-5 year CAGR growth in Sales, EBITDA, Profit & Net Assets
- ii. **Margins:** Gross, EBITDA, EBIT, PBT and Net margins
- iii. **Profitability ratios:** ROCE, ROIC, ROE and EPS
- iv. **Risk & Leverage ratios:** Debt/Equity, DSCR, IC, DOL, DFL and DCL
- v. **Market Values:** Market capitalization and Enterprise Value
- vi. **Market metrics:** P/E, PEG, P/B, EV/Sales, EV/EBITDA, EV/EBIT, EV/Ton etc.
- vii. **Yield metrics:** E/P, Dividend yield & Dividend Payout
- viii. **Shareholding Pattern:** Promoter’s holding, FII holding, Domestic Institutional holding
- ix. **Short term trends:** Moving averages, 52 week high/low & trading volume
- x. **Capital appreciation:** last 3-5 year, last 8 q-o-q returns and TRS (Dividends + Capital appreciation)

Step 3 – Now it’s time to create strategies specific to the investor’s philosophy! By strategies, we mean filters to be applied on a standalone basis or following a particular sequence. This will enable the Analyst to focus on a very narrow range of companies for which research and valuation may be later carried out.

? How does one create Stock Screening Strategies?

Screening may be done using single or multiple metrics (requiring a sequence). Although, there are innumerable permutations & combinations that may be used, most will be inefficient in finding those ‘multi baggers’. It is therefore futile to randomly apply filters. The most popular filters usually start with P/E! Although, we believe that P/E is one of the most misleading metrics (a debate beyond the scope of this article) while contemplating buy/sell decisions, it is the single most popular valuation metric! While Value Investors may screen for low P/E stocks, Growth Investors will tend to scan for high ones and GARP investors may focus more on Profitability before coming down to ascertain reasonability of low or high P/Es. Put Simply, The filtering sequence is driven by the investment philosophy.

Arguably, modern stock selection techniques are influenced/inspired by the theories proposed by the legendary Benjamin Graham. The guiding principles of which were apparently followed by the likes of Warren Buffet, Peter Lynch, John Templeton et al.

? Popular Stock Screening Strategies

i. **Dividend based screening:** Filters starting with this sequence are best suited to Value Investors who may want to focus on a steady stream of cash flows rather than capital appreciation. One may apply filters in the following sequence High Dividend payout ratio >> High Dividend Yield >> High ROE ... The sequence starts with dividend payout rather than dividend yield as payout is a relatively stable metric while yield may fluctuate with the measuring period and share price fluctuations. You may screen for stocks that have the Top 20 Dividend payouts followed by filtering for those that have the top 10 yields and then move on to picking ones with the best ROE (or filter still deeper using other metrics).

However, it must be noted that dividend cannot be the only takeaway, as the best of companies on the Indian bourses will struggle to give yields of >5%. If regular income is your story you'd be better off with bonds! Secondly, companies that do generate great dividend yields are likely to have poor capital appreciation as a result of higher financing needs ... and hence a low TRS!

ii. **P/E based screening:** P/E based screening is arguably the most popular! A typical value investing sequence may look like... Low P/E >> High Growth >> High Profitability >> High Margins... Apparently, most Analysts filter for stocks that have P/Es below 10, before moving on to Growth in Sales, EBITDA & Profit, and finally ROE, ROCE, ROIC & margins. The rationale of an investor following this strategy is, 'Ultimately it's all about EPS' and stocks that trade at lower earnings multiples (i.e. Price/Earnings) are 'cheaper'. Many believe that low P/E stocks have a higher 'Margin of safety' as they are less likely to fall, as a result of 'base effect'. As mentioned earlier, we believe this is grossly incorrect. On the other hand, growth investors believe that high P/E stocks are 'growth' driven and hence make better buys!

iii. **Contrarian screening:** The strategy aims to 'beat' the market! Proponents of this set of strategies are very optimistic about reversal of trends (be it company performance or market sentiment) and hence may pick up the most battered stocks, or good stocks in non-performing sectors etc. believing that, there will be a 'bounce back' in the performance of the company or the market's perception. For e.g. the general belief is that high P/E stocks are better than lower ones, as higher P/Es reflect greater investor confidence. However, the contrarian believes that some 'good stocks' trading at low P/Es have skipped the eyes of the market and will soon be noticed giving their super normal performance. Going by the norm, the approach is risky as it is very difficult to say when such stocks will be noticed (a.k.a. determining their inflection point). The Analyst may filter for stocks in the following sequence Negative EPS >> High Growth >> Positive ROCE... A very uncommon case! Perhaps the contrarian investor is trying to identify those stocks that may be currently loss making but given their high growth, and positive ROCE, may soon start reporting extraordinary profits! You may wonder, what kind of companies such a strategy will pull out. It could include companies that have recently restructured, or ones that are in a high growth phase (e.g. startups), or ones that are at the beginning of the profit cycle (e.g. companies in the sugar sector at the beginning of the season).

In essence, a Contrarian view is a one which is opposed to the majority. It may be argued that there is an intersection between Value investing and Contrarian investing as both aim to find cheap stocks rather than performance oriented ones. A Contrarian view may not be limited to earnings alone but to the choice of sector, growth expectation or other factors. Many successful investors have been contrarians!

Note: The example above was just one of several possible contrarian strategies. Almost every widely followed strategy may be reversed, making it Contrarian.

iv. **Screening for Penny stocks:** These are generally cheap stocks (usually in both senses of the word) and hence a punter's favourite! The sequence of filters may look like this... Low Share Price >> Low P/E >> High Profitability... An investor deploying such a strategy is simply speculating that a low priced stock has lower risk while the upside potential is extraordinary as it is already been beaten by the market and hence has a higher 'margin of safety'. But how will it move up? The investor's belief is that the company will either be restructured or acquired soon and she must wait for that to happen. It is for this reason we call it 'The Scavenger's approach'! Needless to say, it is contrarian by nature.

- v. **Screening for negative EV:** Can Enterprise Value get negative? Mathematically, yes. Read [this](#) for more. The Negative Enterprise Value phenomenon is a rare one. This typically occurs when the broader market crashes (let's say because of 'sentiments' rather than poor fundamentals) as a result, the market capitalization of some good companies may also fall. To a point, where the cash they have is more than the sum of all forms of capital combined! Of course, the stock has been beaten down for no fault of its own. This is the very reason why the investor feels that the stock will bounce back. Although, a screening sequence is not required as very few stocks will be pulled out, yet the investor may choose companies that have a low debt to equity. Indicating that the more cash is available for Equity. **Similar strategies:** include hunting for stocks that have a market capitalization to cash of less than 1 or P/B (Price to Book) multiples below 1 or stocks that are below their 'Liquidation Value' or 'Replacement cost'
- vi. **CANSLIM:** CANSLIM is an abbreviation for **C**urrent Earnings, **A**nnual Earnings, **N**ew Product/Service or Management, **S**upply/Demand, **L**eader/Loser, **I**nstitutional Sponsor and **M**arket Direction. The strategy is a mix of both qualitative and quantitative factors and hence in our view is a 'framework for analysis' rather than a screening strategy. However, you may like to read more about it [here](#)
- vii. **Magic Formula:** Sounds cheesy, but if you believe the 'inventor', (as claimed [here](#) in a seminar organized by New York Society of Security Analysts). Apparently, based on the principles of Value investing the strategy was developed Joel Greenblatt. For more visit [Joel's website](#)
The process is as follows (As sourced from Wikipedia):
1. Establish a minimum market capitalization
 2. Exclude Utility and Financial stocks
 3. Exclude Foreign listings (i.e. ADRs/GDRs)
 4. Determine Earnings Yield i.e. EBIT/Enterprise Value
 5. Determine Return on Capital i.e. EBIT/(Net Fixed Assets + Working capital)
 6. Rank all companies above based on the above two metrics
 7. Invest in 20-30 highest ranked companies, accumulating 2-3 positions per month over a 12 month period
 8. Re-balance the portfolio once per year, selling losers one week before year ending and invest in winners in one week after year ending
 9. Continue over a long term period (>3-5 years)
- In our view the strategy lacks a holistic perspective as it misses out on:**
- a. Past/future growth trends
 - b. Analysis of shareholding pattern
 - c. Risk/leverage analysis
- Apart from the above, it is suitable for HNIs alone, as investing in 20-30 stocks will require substantial deployment of resources (time & money). In emerging economies such a strategy is likely to result in overlooking many critical metrics ... doesn't seem that 'magical' after all!
- viii. **Recommended approach:**
Rationale – An ideal approach should be one that considers the performance of a company in its entirety (or at least close to it). For this, we must try to capture –
- firms future growth prospects (if not available, past trends may be used as a proxy)
 - operational efficiency (i.e. efficiency of the firm/enterprise)
 - along with risk/leverage metrics (leverage may not be all bad!)
 - shareholding pattern (look out for promoter & Institutional holding)
- The approach could be bucketed into GARP investing styles. Like in any of the above strategies, it is important to start with a minimum of top 500 stocks (e.g. the BSE 500).

The recommended steps are:

Step 1: Establish market capitalization

Step 2: Exclude Financial Stocks

Step 3: Choose top 200 stocks – sorted high-to-low based on past 3/5 year CAGR in Sales.

Step 4: Choose top 100 stocks – sorted high-to-low based on ROIC

Step 5: Choose top 50 stocks – sorted high-to-low based on DCL

Step 6: Choose top 25 stocks – sorted low-to-high based on Institutional holding

Step 7: Choose top 8-10 stocks – sorted low-to-high based on P/E

Does the sequence matter?

Absolutely! If you choose a set of companies with the lowest institutional holding first, chances are you've got a bag full of junk as those stocks are likely to be ones that are rejected as a result of poor performance (rather than the ones that have gone unnoticed!) The same applies to other metrics ... especially P/E!

Stepwise rationale:

Step 1: Establish Market capitalization

The investment size must determine the target stock's market capitalization so as to minimize risk arising from liquidity. Put simply, if you are an HNI investing an amount that contributes substantially to the company's total equity capital, chances are that you may face a liquidity crisis at the time of cashing the investment. Secondly, companies with smaller market caps for many other reasons are riskier than larger ones. E.g. Available information/coverage, degree of revenue concentration etc.

Step 2: Exclude Financial Stocks

Financial stocks by the very nature of business will tend to have skewed ratios, especially the ones related to capital structure. They may also show exceptional ROICs and value metrics and hence are best dealt with dedicated strategies.

Step 3: Choose top 200 stocks – sorted high-to-low based on past 3/5 year CAGR in Sales

Past Sales Growth is the best broad metric to judge the health of a business. All other metrics will lose their importance if there is a regularly poor Top-line growth. It may also be seen as a crude proxy for what the future may look like. Secondly, rate of growth is directly related to the value creating potential of a firm. That is, suppose a Firm has a Current EV/Sales of 3 and Sales are expected to grow by 50% it indicates that the stock is likely to have an upside potential of 50% (Needless to say, this assumes that the current valuation is correct!). Put simply, other things being equal, companies that grow faster than peers are likely to create more value for shareholders.

Step 4: Choose top 100 stocks – sorted high-to-low based on ROIC

Return on Invested capital (ROIC) measures the operational efficiency of the firm. As opposed to ROCE, ROIC measures operational return generated by operational assets. The numerator reads NOPLAT (for stock screening purposes EBIT may be used as a crude proxy) while the denominator is [Total Assets – Non-operational items – Current Liabilities]. ROIC measures the profitability of a company's Core operations. This is hence a relatively more stable metric when compared to ROCE (a.k.a. ROC).

Step 5: Choose top 50 stocks – sorted high-to-low based on DCL

Degree of Combined Leverage (DCL) is measured by $(\text{Change in PAT}) / (\text{Change in Sales})$. It measures the risk resulting from fixed costs, broken into operational and financial expenses. Namely, rent, leases, depreciation and Interest expense (the last two being the major contributors of such risk). But they also act as 'fulcrums' to lever PAT. This is what leads to a higher PAT growth as compared to Sales. A very high number indicates very high risk/return and vice-versa. E.g. a DCL of 1.5 indicates that if Sales grew/shrunk by 50% PAT would grow/shrink by 75%. Put simply, if you are bullish on a company's (or the concerned sector's) prospects you would want a higher DCL.

Step 6: Choose top 25 stocks – sorted low-to-high based on Institutional holding

Institutional investors are believed to be the most finicky of investors. They deploy huge amount of funds backed by strong research and low risk appetites (well not exactly!). A higher holding indicates greater investor confidence but also indicates that these stocks are more likely to be battered as a result of bulk selling (in bad market conditions). The reason why we bring in this filter at the penultimate stage

is to ascertain that the stocks are worthy enough to be invested in by an institution, but has yet perhaps gone unnoticed. This shows scope for future institutional buying in the stock!

Step 7: Choose top 8-10 stocks – sorted low-to-high based on P/E

Why now? Why not use this metric as the first filter in the sequence?

This is because, as discussed earlier, the filter would result in a lot of noise when used initially. For e.g. if you choose 200 of the lowest P/E stocks you would end up getting more of junk and less of Value!

However, now we know that all the above 25 stocks (from Step 6) are worthy 'contenders' (as determined by their performance). But the strongest would be the ones that appear to be cheapest for that performance. i.e. the ones that give the maximum 'bang for the buck'!

? But how does one know if the suggested techniques are usable?

Enter back testing! This is the stage where you test the hypothesis. How? Simply use the techniques on historical data (say 2-3 years older) to filter out 8-10 stocks and see how they have performed since that period against the broader market/sector.

The screening process was just the beginning! Now that you have got yourself a bunch of strong contenders, a rigorous research must follow. Thereafter, you may use a combination of valuation techniques to determine a valuation range and upside potential of each before investing.

You may find these articles complementary

- [Stock Picking Strategies](#) at Investopedia
- [Stock Selection Criteria](#) at Wikipedia
- [Greatest Investors](#) at Investopedia