

Detailed Technical Approach of My Investing Process

My investing process shouldn't be a mystery, black-box approach. I want all members to know how I'm investing their money. This is why I'm laying out my approach here. I'm not worried about competitors copying the process because most investors don't have the discipline, patience, and long-term horizon to search out high quality value investments.

Quality + Bargain Value Stock Screen

This stock screen combines the search for quality stocks along with stocks that are bargains. We first eliminate stocks that are in financial distress or could be potential manipulators using the measures described below.

Then we look for which stocks are cheapest based on an EBIT / Total Enterprise Value measurement.

It's quite simple to find cheap stocks, but usually those stocks are cheap for a reason. The challenge lies in figuring out which of those relatively cheap stocks have good quality measures and aren't simply value traps.

We then rank the cheapest stocks based on quality in terms of Return on Assets, Return on Capital, Free Cash Flow, and a quality measure called the Piotroski score.

The measures we use to check for quality are listed below along with the measure we use to test for a stock's cheapness and whether it's an attractively priced bargain.

Financial and Utility stocks are excluded from this screen due to their unique financial structures.

The minimum market capitalization we seek will be \$100 million or higher, but there may be unique circumstances where a great value investment exists at a lower market cap.

We make sure that all stocks we include have data for all the measures we require and that they all report their financials on a quarterly basis.

Currently, our investment universe is all globally listed stocks. The final portfolio cannot have more than 50% dedicated to any one sector. This is so we can achieve diversification and limit our risk.

1. Eliminate the danger stocks

The universe of stocks is first scanned or "cleaned" to eliminate stocks that are in bad financial shape or are potential manipulators.

- a) The first measure we look at is total accruals, which is simply net income less cash flow and is divided or scaled by total assets to compare among all firms. As outlined in a research paper by Richard Sloan, firms with consistently high accruals underperform and may be playing games with their financial statements to show a higher level of net income, whereas the cash flow is low and never materializes.

For more details click here for the research paper:

http://econ.au.dk/fileadmin/Economics_Business/Education/Summer_University_2012/6308_Advanced_Financial_Accounting/Advanced_Financial_Accounting/2/Sloan_1996_TAR.pdf

We eliminate the stocks which are in the top 5% of having the largest scaled total accruals, which can eliminate a lot of potential manipulators.

- b)** The second measure we look at is scaled net operating assets. In a paper by David A. Hirshleifer et al. 2004, they argue that firms with bloated balance sheets, where net operating income overtakes net operating cash flows, tend to underperform over time. They define scaled net operating assets as $NOA = (\text{Operating Assets} - \text{Operating Liabilities}) / \text{Total Assets}$, with operating assets and operating liabilities are defined as:

Operating Assets = Total Assets – Cash and Short-Term Investments, Operating Liabilities = Total Assets – Short-Term Debt - Long-Term Debt - Minority Interest - Preferred Stock - Common Equity

For more details click here for the research paper:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=404120

Scaled net operating assets are then calculated for all firms and the firms that are in the top 5% of the universe for having the highest scaled net operating assets are eliminated.

- c)** The third measure we look at is a model that detects earnings manipulation as written in a research paper by Messod D. Beneish in 1999. This model would've successfully alerted investors to Enron's manipulation in the 2000's.

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.195.3676&rep=rep1&type=pdf>

This is called the PROBM model and calculates the probability of financial manipulation by a firm.

It's composed of eight explanatory variables:

1. Days Sales in Receivables Index (DSRI): DSRI is the ratio of days sales in receivable in the first year to the corresponding measure in year t-1.
2. Gross Margin Index (GMI): GMI is ratio of the gross margin in year t-1 to the gross margin in year t.
3. Asset Quality Index (AQI): Asset quality in a given year is the ratio of non-current assets other than property plant and equipment (PPE) to total assets.
4. Sales Growth Index (SGI): SGI is the ratio of sales in year t to sales in year t-1.
5. Depreciation Index (DEPI): DEPI is the ratio of the rate of depreciation in year t-1 vs the corresponding rate in year t.
6. Sales General and Administrative Expenses Index (SGAI): SGAI is calculated as the ratio of SGA to sales in year t relative to the corresponding measure in year t-1.

7. Leverage Index (LVGI): LVGI is the ratio of total debt to total assets in year t relative to the corresponding ratio in year t-1.

8. Total Accruals to Total Assets (TATA): Total accruals are calculated as the change in working capital accounts other than cash less depreciation.

The PROB M value is calculated as follows with the above variables and the following coefficients:

$$\text{PROB M} = -4.84 + 0.92 \cdot \text{DSRI} + 0.528 \cdot \text{GMI} + 0.404 \cdot \text{AQI} + 0.892 \cdot \text{SGI} + 0.115 \cdot \text{DEPI} - 0.172 \cdot \text{SGAI} + 4.679 \cdot \text{TATA} - 0.327 \cdot \text{LVGI}$$

To get a value for the "Probability of Manipulation" we calculate:

$\text{PMAN} = \text{CDF}(\text{PROB M})$, where CDF is the cumulative density function for a normal (0,1) variable.

We calculate this value for all firms in our universe and eliminate the ones that are in the top 5% in terms of probability of manipulation.

- d) After checking for potential manipulation, we check all firms in our universe for financial distress problems.

We do this using the "Probability of Financial Distress" model conceived by the authors John Y. Campbell, Jens Hilscher, and Jan Szilagyi in a 2010 research paper. The model was successfully able to predict future financial distress for firms.

https://dash.harvard.edu/bitstream/handle/1/9887619/joim_predicting_financial_11.pdf?sequence=2

The model has eight explanatory variables as follows:

1. Net income to market total assets (NIMTAAVG).
2. Total liabilities to market total assets (TLMTA).
3. Cash to market total assets (CASHMTA).
4. Excess return compared to the S&P 500 (EXRETAVG).
5. Standard deviation of daily returns over the past three months (SIGMA).
6. Relative size (RSIZE).
7. Market-to-book equity ratio (MB).
8. The log of the stock price, capped at log(15) (PRICE).

The logit formula to compute the probability of financial distress (PFD) is as follows:

$$\text{LPFD} = -20.12 * \text{NIMTAAVG} + 1.60 * \text{TLMTA} - 7.88 * \text{EXRETAVG} + 1.55 * \text{SIGMA} - 0.005 * \text{RSIZE} - 2.27 * \text{CASHMTA} + 0.070 * \text{MB} - 0.09 * \text{PRICE} - 8.87$$

Then, one calculates the actual percentage probability of financial distress as follows:

$$\text{PFD} = 1/(1+e^{-\text{LPFD}})$$

We calculate the above probability of financial distress for all firms in our universe and eliminate those that are in the top 5% at highest risk.

2. Rank all stocks based on cheapness with the EBIT / Total Enterprise Value Measure

There has been sufficient research to show that the best performing ratio for detecting a bargain / cheap stock is the EBIT / Total Enterprise value.

<https://thecalminvestor.com/best-value-investing-metric/>

EBIT is simply earnings before interest and taxes. Total enterprise value (TEV) = market cap + total debt - excess cash + preferred stock + minority interests, where Excess Cash = Cash - MAX(0, Current Liabilities - Current Assets + Cash)

By comparing stocks based on an EBIT / TEV basis, we are making an apples-to-apples comparison of all stocks since the capital structure in terms of mix of debt and equity and tax situation of each firm is different.

See below how one of the greatest value investors, Joel Greenblatt uses this EBIT / TEV measure in what he calls "The Magic Formula."

<https://seekingalpha.com/article/4027533-greenblatt-wizardry-quantitative-look-magic-formula>

We rank all stocks based on the EBIT / Total Enterprise Value Measure and choose the top 10% based on this score. From this 10%, we move on to determine the highest quality stocks as described below.

3. Quality Measures

Next, we look for the high quality stocks among the above cheapest ones with high return on assets (ROA), high return on capital (ROC), positive free cash flows, and a quality measure called the Piotroski score.

- a) Return on Assets (ROA) is calculated as net income before extraordinary items divided by total assets. We take a 5 year geometric average of the ROA and rank all firms by which percentile they fall into.
- b) Return on Capital (ROC) is calculated as EBIT / (Net Property, Plant and Equipment + Net Working Capital), where Net PP&E means Net of all Depreciation Expenses, and Net Working Capital = Current Assets - Current Liabilities. We take a 5 year geometric average of the ROC and rank all firms by which percentile they fall into.
- c) We then take a look at a company's free cash flow over the past 5 years and divide that by their most recent total assets. (CFOA). Free cash flow is defined as net cash provided by operations minus capital expenditures. All firms are again ranked by which percentile they rank in for free cash flow.
- d) We then check for how healthy a company is using a measure called the Piotroski F-Score which ranks stocks based on profitability, healthy balance sheets, leverage, liquidity, and operating efficiency.

According to the American Association of Individual Investors, the F-Score was the only one of fifty-six screening methodologies that had positive results for 2008.

<http://www.businessinsider.com/the-piotroski-f-score-reviewing-joseph-piotroskis-accounting-based-value-investing-screen-2011-4>

The original paper can be found here:

<https://www.chicagobooth.edu/~media/FE874EE65F624AAEBD0166B1974FD74D.pdf>

The formula has 9 variables and is as follows:

$$F_SCORE = F_ROA + F_DELTA_ROA + F_CFO + F_ACCRUAL + F_DELTA_MARGIN + F_DELTA_TURN + F_DELTA_LEVER + F_DELTA_LIQUID + EQ_OFFER$$

$F_ROA = 1$ if net income is positive for the past year, 0 otherwise

$F_DELTA_ROA = 1$ if return on assets is higher this year than the previous, 0 otherwise

$F_CFO = 1$ if there is positive cash flow from operations this year, 0 otherwise

$F_ACCRUAL = 1$ if cash from operations exceeds net income for the year, 0 otherwise.

$F_DELTA_MARGIN = 1$ if the gross margin which is $(Revenue - Cost\ of\ Goods\ Sold) / Revenue$ is higher this year than last, 0 otherwise.

$F_DELTA_TURN = 1$ if there is a higher asset turnover ratio $(Total\ Sales / Beginning\ of\ year\ total\ assets)$ this year than last, 0 otherwise.

$F_DELTA_LEVER = 1$ if there is a lower ratio of long-term debt to total assets this year compared to last, 0 otherwise.

$F_DELTA_LIQUID = 1$ if there is a higher current ratio $(Current\ Assets / Current\ Liabilities)$ this year compared to last, 0 otherwise.

$EQ_OFFER = 1$ if the firm did not issue new shares / equity in the preceding year, 0 otherwise.

We calculate the F_SCORE for all stocks and rank the stocks according to which percentile they fall into in terms of F_SCORE .

- e) Finally, we take each stock and take an average of which percentile it fell into in terms of ROA, ROC, CFOA, and the F_SCORE and average it to come up with a final QUALITY percentage score.

The cheapest 10% of the stocks ranked by $EBIT / TEV$ are then ranked based on quality and we choose the top stocks based on how many we'd like to include in our basket from there.

To sum it up, here's the process:

1. Determine investable universe, eliminate the danger stocks that are financially distressed or playing games with their financials.
2. Find cheapest stocks.
3. Sort the cheapest stocks based on quality.
4. Choose your basket of stocks from the top results.