FINDING THE WINNERS AMONG LOW PRICE-TO-BOOK-VALUE STOCKS

By John Bajkowski

Simple value screens that look only for low prices relative to some measure of value tend to produce lists that include a few hidden winners among many losers. One promising new study, however, develops a nine-point scoring system that seeks to identify low-valued stocks that also have solid and improving financials.

Numerous research studies point to the long-term success of using value strategies to select stocks. Value strategies build stock portfolios by seeking out stocks with low prices relative to variables such as earnings, book value, cash flow, or dividends. However, most academic research relies on constructing large portfolios that beat the market on average—with a few big winners, but also containing many losing stocks.

Recently Joseph Piotroski, an accounting professor at the University of Chicago Graduate School of Business, undertook a study of low price-to-book-value stocks to see if it's possible to establish some basic financial criteria to help separate the winners from the losers.

LOW PRICE-TO-BOOK-VALUE RATIO

Piotroski's work starts with low-price-to-book-value stocks. Price relative to book value was a favorite measure of Benjamin Graham and his disciples who sought companies with a share price below their book value per share. While the market does a good job of valuing securities in the long run, in the short run it can overreact to information and push prices away from their true value. Measures such as the price-to-book-value ratio help identify which stocks may be truly undervalued and neglected.

The price-to-book-value ratio is determined by dividing market price per share by book value per share. Book value is generally determined by subtracting total liabilities from total assets and then dividing by the number of shares outstanding. It represents the value of the owners' equity based upon historical accounting decisions. If accounting truly captured the current values of the firm, then one would expect the current stock price to sell near its accounting book value. Over the history of a firm, many events occur which can distort the book value figure. For example, inflation may leave the replacement cost of capital goods within the firm far above their stated book value, or the purchase of a firm may lead to the establishment of goodwill, which is an intangible asset, boosting the level of book value. Different accounting policies among industries may also come into play when screening for low price-to-book stocks.

AAII's *Stock Investor Pro* was used to perform this screen suggested by Piotroski. *Stock Investor Pro* covers a universe of 9,371 NYSE, Amex, Nasdaq National Market, Nasdaq Small Cap, and over-the-counter stocks. Piotroski first limited his universe to the bottom 20% of stocks according to their price-to-book-value ratio. Our first consideration is that only 8,127 stocks have current price-to-book-value ratios in *Stock Investor*. A company must have a positive book value to have a meaningful price-to-book-value ratio. A 20% cut-off translates into approximately 1,600 stocks with a maximum price-to-book-value ratio of 0.72.

Piotroski found that most stocks trading with an extremely low price-to-book-value ratio were either neglected or financially troubled firms. Small, thinly traded stocks are rarely followed by analysts. The flow of information is limited for these stocks and can lead to mispriced stocks. Analysts typically

John Bajkowski is AAII's financial analysis vice president and editor of Computerized Investing.

TABLE 1. PIOTROSKI'S VALUE SCREEN

Company (Exchange: Ticker)	Price-to-Book (X)	Return on Assets Y1 (%)	Cash From Oper's Y1 ($ Mil)	Income After Taxes Y1 ($ Mil)	LT Debt to Assets Y1 (%)	Current Ratio Y1 (X)	Gross Margin Y1 (%)	Asset Turnover Y1 (X)	Market Cap Q1 ($ Mil)	Description
PrimeSource (M: PSRC)	0.40	2.7	17.3	5.1	29	2.5	16.2	2.9	25.1	Publishing prods
Rocky Shoes & Boots (M: RCKY)	0.42	0.1	9.1	0.1	31	8.4	23.3	1.2	20.5	Footwear
Franklin Electronic Pbls. (A: FEP)	0.43	3.9	10.1	2.7	14	2.7	36.5	1.4	20.3	Handheld elec references
Acorn Holding (M: AVCC)	0.52	6.6	0.8	0.5	0	4.7	33.8	0.9	3.5	Holding co, silicon wafers
U.S. Vision (M: USVI)	0.54	5.9	9.5	4.8	24	2.6	69.8	1.8	27.3	Optical prods & servs
Greif Brothers (M: GBCOA)	0.55	3.0	117.2	62.4	25	3.3	25.7	1.0	678.8	Indus shipping mat'ls
Millbrook Press (M: MILB)	0.64	4.9	3.5	1.1	20	1.6	44.9	1.0	8.8	Kid's non-fiction books
Delta Apparel (A: DLA)	0.68	5.9	16.5	4.7	12	3.0	17.8	1.4	41.4	Sportswear
Racing Champions (M: RACN)	0.72	2.3	38.6	5.9	37	1.9	45.9	0.9	76.4	Die cast collectibles

Source: AAII's Stock Investor Pro/Market Guide Inc. Statistics are based on data as of 6/29/2001.

Exchange Key: N = New York, A = American, M = Nasdaq

ignore these stocks and tend to focus on stocks with general interest.

Financially distressed firms may be beaten down below their intrinsic value as investors await strong signs that a company has fixed its problems and the worst is behind it. Poor prior performance often leads to overly pessimistic expectations of future performance. This pessimism translates into above-market performance as companies outperform market expectations in subsequent quarters.

Piotroski found either situation can create buying opportunities, after checking on financial strength, especially when studying smaller-cap stocks.

FINANCIAL CONDITION

Piotroski developed a nine-point scale that helps to identify stocks with solid and improving financials. Profitability, financial leverage, liquidity, and operating efficiency are examined using popular ratios and basic financial elements that are easy to find and apply. For this article, a passing stock is required to have a perfect score of nine.

PROFITABILITY

Piotroski awarded up to four points for profitability—one for positive return on assets, one for positive cash flow from operations, one for an improvement in return on assets over the last year, and one if cash flow from operations exceeds net income. These are simple tests that are easy to measure. Because the requirements are minimal, there is no need to worry about industry, market, or time-specific comparisons.

Piotroski defined return on assets as net income before extraordinary items for the fiscal year preceding the analysis, divided by total assets at the beginning of the fiscal year. Return on assets examines the return generated by the assets of the firm. A high return implies the assets are productive and well-managed.

Piotroski did not look for high levels, only a positive figure. While the screen may not seem to be very restrictive, he found that over 40% of the low price-to-book-value stocks had experienced a loss in the prior two fiscal years. Positive income is a significant event for these firms.

About 4,000 stocks in *Stock Investor* had positive return on assets over their last fiscal year. Adding the screen for positive return on assets to the low price-to-book universe dropped the number of passing companies from 1,667 down to 621.

Piotroski awarded one point if a firm had positive operating cash flow. Operating cash flow is reported on the statement of cash flows and is designed to measure a company's ability to generate cash from day-to-day operations as it provides goods and services to its customers. It considers factors such as cash from the collection of accounts receivable, the cash incurred to produce any goods or services, payments made to suppliers, labor costs, taxes, and interest payments. A positive cash flow from operations implies that a firm was able to generate enough cash from continuing operations without the need for additional funds.

Approximately 5,300 stocks had positive cash from operations for the their most recent fiscal year. Adding this criterion, the screen reduced the number of passing companies from 621 to 433.

The next variable Piotroski considered sought improving profitability. Piotroski awarded one point if the current year's return on assets was greater than the prior year's return on assets. While Table 1 does not list the prior year return on assets, all of the passing companies exhibited significant improvement. Sixty percent of the stocks went from negative to positive return on assets.

In the complete *Stock Investor* universe, 4,111 stocks showed an improvement in return on assets. But adding the variable to the overall screen reduced the number of passing stocks from 433 to 222.

The final profitability variable examines the relationship between the earnings and cash flow. A point is awarded if cash from operations exceeded net income before extraordinary items. The measure tries to avoid those firms making accounting adjustments to boost earnings in the short run, that may in turn weaken long-term profitability. Piotroski feels that this element may be especially important for value firms, which may have a strong incentive to manage earnings to avoid triggering problems such as violations to debt covenants.

In *Stock Investor Pro*, income after taxes represents income before extraordinary items. Therefore, the screen looked for firms with cash from operations greater than income after taxes for the most recent fiscal year. By itself, this variable was not very restrictive. Nearly 7,000 of the stocks within the complete universe passed the filter. Adding the criterion to the overall screen reduced the number of passing companies from 222 to 169.

CAPITAL STRUCTURE

Piotroski awarded up to three points for capital structure and the firm's ability to meet future debt obligations—one if the ratio of debt to total assets declined in the past year, one if the current ratio improved over the past year, and one if the company did not issue any additional common stock.

Piotroski defined debt to total assets as: total long-term debt, plus the current portion of long-term debt, divided by average total assets. The higher the figure, the greater the financial risk. Judicious use of debt allows a company to expand operations and leverage the investment of shareholders—provided that the firm can earn a higher return than the cost of debt. Normally, the more stable the cash flow of a firm, the greater financial risk a company can assume. However, a company must meet the rules (covenants) along with the interest payments of its debt—or risk bankruptcy and complete loss of control of the firm. By raising additional external capital, a financially distressed firm is signaling that it is unable to generate sufficient internal cash flow. An increase in long-term debt will place additional constraints on the financial flexibility of a firm and will likely come at great cost.

A custom field was used to calculate the debt-to-equity ratio within *Stock Investor* and the screen looked for a fiscal year improvement. About 3,800 stocks showed a fiscal year decrease in debt to total assets when examining the complete 9,371 stock universe. The criterion further reduced the number of passing companies from 169 to 100.

To judge liquidity, a company earns one point if its current ratio at the end of its most recent fiscal year increased compared to the prior fiscal year. Liquidity ratios examine how easily the firm could meet its short-term obligations, while financial risk ratios examine a company's ability to meet all liability obligations and the impact of these liabilities on the balance sheet structure.

The current ratio compares the level of the most liquid assets (current assets) against that of the shortest maturity liabilities (current liabilities). It is computed by dividing current assets by current liabilities. A high current ratio indicates high level of liquidity and less risk of financial trouble. Too high a ratio may point to unnecessary investment in current assets, or failure to collect receivables, or a bloated inventory—all of which negatively affect earn-

Definitions of Terms

Price-to-Book: Market price per share divided by book value per share. A measure of stock valuation relative to net assets. A high ratio might imply an overvalued situation; a low ratio might indicate an overlooked stock.

Return on Assets Y1: Net income divided by total assets for the most recent fiscal year. Provides a measure of management's efficient use of assets.

Cash From Operations Y1 ($ Mil): The cash flows from operations for the most recent fiscal year. This is taken directly from the company's statement of cash flows.

Income After Taxes Y1 ($ Mil): Income after taxes for most recent fiscal year.

LT Debt to Assets Y1: Long-term debt divided by total assets. (Long-term debt is defined as liabilities due in a year or more—and the portion of long-term debt classified as current.)

Current Ratio Y1: Current assets, including cash, accounts receivable and inventory, divided by current liabilities, including all short-term debt for the latest fiscal year. A rough measure of financial risk: the smaller current assets relative to current liabilities, the greater the risk of credit failure.

Gross Margin Y1: Gross margin (net sales less cost of goods sold) for the latest fiscal year.

Asset Turnover (Y1): Total asset turnover for the latest fiscal year. Computed by dividing total sales by the total assets for the same period. Measures the amount of sales volume the company is generating on its investment in assets.

Market Cap Q1 ($Mil): Number of common stock shares outstanding times share price for the most recent quarter. Provides a measure of firm size.

ings. Too low a ratio implies illiquidity and the potential for being unable to meet current liabilities and random shocks that may temporarily reduce the inflow of cash.

Piotroski assumed that an improvement in the current ratio is a good signal regarding a company's ability to service its current debt obligations. He also indicated in a footnote that the decline in the current ratio was only significant if the current ratio is near one. All of the passing stocks have the current ratios well above this cutoff; 3,037 stocks showed an increase in the current ratio. Adding this criterion to the screen reduced the number of passing companies from 100 to 52.

The final capital structure element awards one point if the firm did not issue common stock over the last year. Similar in concept to an increase in long-term debt, financially distressed companies that raise external capital could be indicating that they are unable to generate sufficient internal cash flow to meet their obligations. Additionally, issuing stock while its stock price is depressed (low price-to-book) highlights the weak financial condition of the company.

Adding this criterion to the screen reduced the number of passing companies from 52 to 30. Independently, 3,000 stocks maintained or reduced the number of outstanding shares during their last fiscal year.

OPERATING EFFICIENCY

The remaining two elements examine changes in the efficiency of operations. Companies gain one point for showing an increase in their gross margin and another point if their asset turnover has increased over the last fiscal year. The ratios reflect two key elements impacting return on assets.

Long-term investors buy shares of a company with the expectation that the company will produce a growing future stream of cash. Profits point to the company's long-term growth and staying power. Gross profit margin reflects the firm's basic pricing decisions and its material costs. It is computed by dividing gross income (sales less cost of goods sold) by sales for the same time period. The greater and the more stable the margin over time, the greater the company's expected profitability. Trends should be closely followed because they generally signal changes in market competition.

Piotroski zeroed in on improving gross profit margin because of immediate signals of an improvement in production costs, inventory costs, or increase in the selling price of the company's product or service. In our universe, 3,332 stocks showed an improvement in year-over-year gross profit margins. The gross margin criterion reduced the number of passing companies from 30 to 19.

The final element in Piotroski's financial scoring system adds a point if asset turnover for the latest fiscal year is greater than the prior year's turnover.

Asset turnover (total sales divided by beginning period total assets) measures how well the company's assets have generated sales. Industries differ dramatically in asset turnover, so comparison to firms in similar industries is crucial. Too high a ratio relative to other firms may indicate insufficient assets for future growth and sales generation, while too low an asset turnover figure points to redundant or low productivity assets.

An increase in the asset turnover signifies greater productivity from the asset base and possibly greater sales levels. In our database, 3,345 stocks showed in improvement in asset turnover. The asset turnover improvement criterion reduced the number of passing companies from 19 to 12.

To help ensure minimum liquidity and financial reporting standards, over-the-counter stocks and ADRs were excluded. The nine firms that remained are listed in Table 1.

The list represents a diverse set of primarily small-cap stocks. Franklin Electronics produces handheld electronic reference products such as dictionaries, language translators, biblical references, and even medical reference materials. Sales have declined in recent years as people have shifted from dedicated handheld electronic databases to general purpose Palm and Pocket PC PDAs (personal digital assistants). Its low price-to-book-value ratio of 0.43 reflects the market's uncertainty of Franklin Electronic's big bet on the future of E-books with its latest general purpose E-book reader and PDA. For this stock to do well, its bet must pay off.

The screen in this article required a perfect score of nine. Requiring a score of eight, would have lead to 42 passing stocks. Overall, Piotroski found that the higher the financial score, the higher the average portfolio return.

Piotroski's work consists of creating low-price-to-book portfolios and further segmenting them in varying portfolios of financial strength. Overall, the higher the financial score the greater the average portfolio return. Results of individual stocks will vary dramatically. Even with these additional financial tests, it is important to perform a careful analysis of any passing stocks. ✥