New Screens, Custom Metrics, and Validation V5 - 7/10/18

**Abstract:**  We have implemented several of the screens and composites that O’Shaughnessy has proposed in his book: “What Works on Wall Street”, 4th edition, 2012 on AAII’s Stock Investor Pro. Differences in definitions (and ambiguities there in) may have caused modified versions. This required a sanity check of analyzing a few companies in detail. This documents all this work.

**Background:** O’Shaughnessy has developed five composites: Financial Strength Composite, Earnings Quality Composite, and three Value Composites (One, Two, and Three). We include two factors, as pertinent to estimating true book value and true total accrual. We also list the components of three new screens for avoidance, fraud, and momentum. Details for these are provided in the table below:

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| --- | --- | --- | --- |
| Composite / Factor (Additional/ Replacement) / Screen | Explanation | Factors Included | Reference |
| Earnings Quality Composite (AccComp\_1, AccComp\_2, AccComp\_3, & AccComp\_4) | Uses four accounting variables of O’S | Total Accruals to Total Assets; % Change in Net Operating Assets, Total Accruals to Average Assets, and Depreciation Expense to Capital Expense | Pp. 293, O’Shaughnessy (2012) |
| Financial Strength Composite (FinComp\_1, FinComp\_2, FinComp\_3, FinComp\_4, & FinComp\_4N) | Uses four financial strength factors of O’S + 1 new one (FCFE/Debt ratio) | Debt to Equity,  % Change in Debt,  External Financing and Cash Flow to Debt Ratio. | O’Shaughnessy (2018) |
| Value Composite One (ValComp\_1, \_1N, \_2, \_2N, \_3, \_4, \_4N, and \_5) | Uses five ‘pure play’ balance sheet and cash flow ratios to identify value stocks | Price to Book, Price to Earnings, Price to Sales, EBITDA/EV, and Price to Cash Flow. | Pp. 302, O’Shaughnessy (2012) |
| Value Composite Two  Value Composite One + Dividend Yield % (yet to do) | Adds shareholder yield to Value Composite One | Value Composite One Factors + Shareholder (Buyback + Dividend) Yield | Pp. 302, O’Shaughnessy (2012) |
| Value Composite Three: Value Composite One + ValComp\_6 | Adds buyback yield to Value Composite One | Value Composite One Factors + Buyback Yield | Pp. 323, O’Shaughnessy (2012) |
| Additional Factor: Enhanced Book Value. Used in addition to traditional book value for Value Composites | Accounts for negative book value, a consequence of accounting principles | Research Asset, Brand Asset, Real Estate Value, and Buybacks and Dividends | Fairchild (2018). Goal is to isolate veiled (good) value stocks from other negative book value stocks. |
| Additional Factor: Free Cash Flow to Equity (FCFE). Used in addition to traditional Cash Flow for Value Composites and Financial Composite. | EBITDA, often used as a proxy to cash flow, differs in magnitude and behavior. Replace with FCFE. Also replacing CF. | Use Richardson (2005) metrics: Calculate Total Accrual (TACC) and deduct from ROA to get FCFE | Trejo-Pech et al., (2008). |
| Replacement Factor: TACC for Accruals | SIP’s Accruals is replaced by a more recent equation of Richardson. | See above | Trejo-Pech et al., (2008). |
| Partial Value Composite: ValueComposite\_Partial | Comprised of four VC components for which SIP provides %Rank | ValComp\_1, ValComp\_2, ValComp\_3, and ValComp\_5 | SIP. Value composites will be implemented on exported data with this screen. |
| Avoidance Screen | These are ‘growth’ companies that may look good on paper, but are not. | Highest quintile of TACC to Total Assets; Negative FCFE; and >70% FIN and NCO components of TACC | Trejo-Pech, C.O., et al., (2008). Included in the Fraud screen’s QOA. |
| Fraud Screen for Bankruptcy and Fraud | Uncovers financial problems at a company. Note: AAII has an article in July 2018 issue on financial shenanigans. | SEC Letters to companies (From Edgar Database) and four factors (low values): QOA = TACC Bad Flag, Altman Z score (<3), Quality of Earnings (<1), and Quality of Revenues (<1). | Grove et al. (2010) and SEC Edgar database of letters. Z bad int flag sets to 0.5 for 1.8 to 3, and 1 for <1.8. If total score (Fraud\_Prescr\_partial) >2.5, check SEC letter. If true, FraudFlag is set to 1. |
| Momentum Screen | Find Growth stocks while avoiding speculative stocks; Keep an eye on yield inverse | Above median for 3 mo and 6 mo mom; <30% for 5 year mom; <median for price volatility for 12 mo; < median for trading price volume | O’Shaughnessy (2012) |

The Book value used in Value Composites above may be improved using the Enhanced Book Value composite developed by Fairchild (2018). Similarly, FCFE substituted for EBITDA may provide improved Value Composites and Financial Composite. I am using these as additional factors, not in lieu of, until their replacement is well vetted.

Fraud Screen is set up to avoid certain stocks. Red flags for distressed companies are: Z score <3.0 (with 18 to 3.0 as bad or yellow flag); Quality of Earnings (ratio of Operating Cash Flow to Net Income) <1; and Quality of Revenues (ratio of Cash collected from customers plus accounts receivables to Revenue) <1. The SEC letter was a leading indicator, by 100 days.

Momentum Screen is set up to identify growth stocks that have appreciated substantially recently. They may be held for 1 year and re-evaluated, as all others would have to be.

Avoidance Screen: It includes these ‘growth’ companies: Highest quintile of TACC to Total Assets; Negative FCFE; and >70% FIN and NCO components of TACC.

Initial Screen for Value Composites will use below median value for the four parameters. There may be a need to build additional screens with comparison to median, so as to reduce the number of companies exported.

**Methods and Rationale:**

1. **Identification of companies with EBITDA manipulation** [Trejo-Pech et al., 2012]**:**
2. Total Accruals (TACC): It is defined as the year-to-year change in (WC + NCO + FIN), where WC is the working capital, NCO is the net non-current operating assets, and FIN is the net financial assets. We implement TACC as (TACC\_Y1 - TACC\_Y2), where TACC\_Y1 is the accrual for Year 1 (similarly for Y2). The sub-terms are calculated as follows: WC is available in SIP (Stock Investor Pro) as WORK. NCO is calculated as the difference of NCOA (non-current operating assets) and NCOL (non-current operating liabilities), where NCOA = (Total Assets – Current Assets – Long Term Investment), and NCOL = (Total Liabilities – Current Liabilities – Long Term Debt). FIN is calculated as the difference of FINA (Financial Assets) and FINL (Financial Liabilities), where FINA = (Short Term Investments + Long Term Investments), and FINL = (Long Term Debt + Short Term Debt + Preferred Stock).
3. Free Cash Flow to Equity (FCFE): It is defined as the difference of ROA and TACC, divided by the number of shares. ROA is explained to be earnings and not the typical acronym for Return on Assets, implemented here as EBIT.
4. Relevance of TACC and FCFE: Trejo-Pech et al., 2006, analyzed these metrics for Agribusiness. Their Table 1 lists TACC, ROA, FCFE, and EBITDA, along with the TACC subcomponents for both Agribusiness and the whole universe of businesses. TACC and FCFE are new metrics of Richardson et al. (2005). EBITDA is the largest of all the cash flow entries (FCFE < ROA (EBIT) < EBITDA), perhaps the reason why it is used by companies for reporting their earnings. FCFE is a better measure. Table 3 splits the Agribusinesses into 5 quintiles based on the magnitude of Total Accruals expressed as a percentage of Total Assets. The higher the quintile the larger is the accrual. Higher quintile companies are considered the faster growing companies and require higher cash flow to support their growth. For the highest quintile, FCFE is negative, while EBITDA (and ROA) is the highest of all the quintiles and positive. This is a suspicious manipulation of reported earnings. FIN is negative implying an outflow to pay creditors, unlike the other four quintiles. CO and FIN add to a large portion of TACC unlike other quintiles. The former are the new components that they add to the classical definition of accruals. *So, there could be* ***another test*** *that I can put: Do these terms add to more than 70%? Is FCFE negative? If so, avoid.* EBITDA is misleading and is useful only for the most conservative companies, where EBITDA < CF, both Sloan measures and found in SIP. Depreciation for all quintiles was the same.
5. **Bankruptcy and Fraud Analysis - BFA** [Grove et al., 2010]: SEC Comment Letters to companies on improprieties in their filing are available in SEC’s Edgar Database and may be a 100 day leading indicator of stock performance. These are not Auditing Enforcement Releases (AAERs) which occur when the SEC actually takes action against a company for financial reporting problems. The authors develop a Red Flag model with 6 subcomponents: (1) **QOE** - Quality of Earnings: (Operating Cash Flow) / Net Income for the period. A value of <1 is a red flag. Also, check for large fluctuations quarter to quarter. (2) **QOR** - Quality of Revenues: (Revenues + AR)/ Revenues. Emphasis is on cash relative to sales. A value of <1 is a red flag. (3) Quality of Accrual – **QOA** - Sloan Accrual measure. I will replace their measure with **TACC / Total Assets** due to Robinson et al. (2005). Check if CO and FIN > 70% of TACC. If so, set Flag to 1. Check FCFE if negative as a confirmatory test. (4) Altman **Z**-score (SIP provides this as Z value). Z < 1.8 is a traditional bankruptcy red flag, with Z of 1.8 to 3.0 with possible bankruptcy values. We will adopt the latter. (5) Z-score (old Fraud model)- It is not available in SIP and is too involved for me to compute. So, not computed. (6) F-Score (new Fraud model). This is not the F Score available in SIP and will also not be computed. So, my flags: SEC Letter, QOE, QOR, QOA, and Z, for a total of 5 flags. SEC will be checked only for those that are finally selected for investments in, to reduce the labor involved. ***Action: Build R program for SEC letter flag later on***. So BFAF = QOEF + QORF + QOAF + ZF. **Relevance:** The authors analyze 366 companies that received a Comment Letter for performance. Growth rate increases as the number of flags increased from 0 to 5, reflecting the common practice among manipulators of improperly increasing revenues. Market Capitalization also drops – market realization perhaps that manipulation has occurred. The authors analyzed performance during the following 700 days (about 3 years of trading), subsequent to the letter, using values of 0 to 6 for the number of flags and divided into 5 quintiles. The excess return was positive only for companies in the lowest quintile, with the highest quintile dropping 80% during this period.
6. **Enhanced Book Value: EnhBookValuePS** [Fairchild, 2018]: The Price-to-Book ratio has a problem. Adhering to GAAP is forcing many US companies to report low or negative book values. The Value factor would exclude such companies because of their high or negative P/B ratio, though they look cheap based on other metrics that make up Value Factors. Such companies survive and thrive for many years, outperforming the market 57% of the time. This group comprises of true negative equity (n = 118 now) and ‘veiled value’ stocks (n = 258). The later are companies that rank in the most expensive 33% by price to book, but the cheapest 33% by other valuation metrics. However, over 90% of the Veiled Value group of stocks is defined as growth stocks by Russel’s methodology, shifting some of the performance from Value funds to Growth funds. Negative equity funds are classified as distressed. Fairchild provides a framework for estimating better the book value for such companies by including the following: intangible assets (brand names, human capital, advertising, and R&D) that are rarely represented on the balance sheet; long term assets (that get depreciated faster than their useful lives); and buybacks and dividends (when these exceed net income, they create in equity which can accelerate distortions). Since SIP does not provide all the required parameters, the following is an improvised version that adds a composite based on the following four items, to the book value in SIP: (1) R&D Expense: Average of R&D values over the past 5 years; (2) Brand Asset: Average of Goodwill and Intangibles over the past 5 years; (3) Real Estate Value: Average of Depreciation over the past 5 years – this is a poor substitute, but could not find anything better; and (4) Buyback and Dividends – is a multiple on the sum of the first three items. My multiple has a value of 0.5 to 0 to 1.5 depending upon the SHY values of negative to 0 to positive. **Result:**  Fairchild computed a different version of Enhanced Book Value and determined the performance of 5 quintiles of Price to Book value (1964-2018). Excess return for the cheapest quintile is 2.2% for enhanced book value vs 1.1% for traditional book value; the most expensive quintile has an excess return of -5.1% for enhanced book value vs -3.1% for traditional book value. This shows that adjustment can be made to make the price to book value a reliable and useful metric in constructing value-oriented stocks.
7. **Earnings Quality Composite:** It comprises of: (1) Total Accruals to Total Assets: AccComp\_1; (2) % Chng to Net Operating Assets: AccComp\_2; (3) Total Accruals to Average Assets: AccComp\_3; (4) Depreciation Expense to Capital Expense: AccComp\_4. The first three: low is good; the last one: high is good. NA= 50 yet to implement
8. **Financial Strength Composite:** (1) Debt to Equity; FinComp\_1; (2) % Change in Debt: FinComp\_2; (3) Extl Financing: FInComp\_3; and (4) Cash Flow to Debt Ratio: FinComp\_4. NA=50 yet to implement.
9. **Value Composites:**

**Implementation in Stock Investment Pro:**

|  |  |  |  |
| --- | --- | --- | --- |
| Custom Variable Name | Description | Equation | Comments (use) |
| **AccComp\_1** (%AccComp1Inv in Excel) | Ratio of Total Accruals to Total Assets. Low is good | [TotalAccrual]/[Total assets Y1])). *How do low book, but value stocks, impact this?* | Used in Accounting Composite; uses Custom TotalAccrual |
| **AccComp\_2** (%AccComp2Inv in Excel) | % Chng in Net Operating Assets from Y2 to Y1, as percentage. If NOA\_Y2 <=0, return 0.Low is good | IIF(([NOA-Y2]> 0),( ([NOA-Y1]/[NOA-Y2])-1)\*100, 0 ) | Used in Accounting Composite |
| **AccComp\_3**  (%AccComp3Inv in Excel) | Ratio of Total Accruals to Total Avg Assets. Low is good | [TotalAccrual]/(0.5 \* ([Total assets Y1] + [Total assets Y2]) *How do low book, but value stock, impact this?* | Used in Accounting Composite; Uses Custom TotalAccrual |
| **AccComp\_4**  (%AccComp4 in Excel) | Ratio of Depreciation to Capital Expenditures (Q1 to Q4).High is good. | IIF(([Capital expenditures Q1]+[Capital expenditures Q2]+[Capital expenditures Q3]+[Capital expenditures Q4]) > 0), ([Depreciation Y1] /([Capital expenditures Q1]+[Capital expenditures Q2]+[Capital expenditures Q3]+[Capital expenditures Q4])), 0 ) | Used in Accounting Composite |
| ~~Avg\_Dollar\_Trading\_Volume.~~ Replaced with Trading\_Volume\_Dollars | Six month average from Sum of (Monthly Price Close \* Monthly Trading Volume) | ([Price M001] \* [Price--Volume M001] + [Price M002] \* [Price--Volume M002] + [Price M003] \* [Price--Volume M003] + [Price M004] \* [Price--Volume M004] + [Price M005] \* [Price--Volume M005] + [Price M006] \* [Price--Volume M006])/6 | Used in Momentum Composite |
| Brand\_EBV | Brand Asset Value - using Goodwill and Intangibles instead | ([Goodwill and intangibles Y1]+[Goodwill and intangibles Y2]+[Goodwill and intangibles Y3]+[Goodwill and intangibles Y4]+[Goodwill and intangibles Y5])/5 | Used in O'S Enhanced Book Value. |
| DeltaNetFinlAssets | Change in FIN: FIN = FINA - FINL; FINA = (STInv + LTInv); FINL = LTD + STD+PrefStock. | [FIN\_Y1]-[FIN\_Y2] | Used in calculating TACC |
| DeltaNetNonCurrOpAssets | Change in NCO; NCO= (NCO Assets - NCO Liabs); NCO = (TA-CA-LTInv) - (TL-CL-LTD) | [NCO\_Y1]-[NCO\_Y2] | Used in calculating TACC |
| DeltaWorkingCapital | WC Y1 - WC Y2 | ([Working Capital Y1] - [Working Capital Y2]) | Used in calculating TACC |
| ~~EBITDA/EV\_Max100~~ | Inverse of EV/EBITDA; multiplied with100; limit to 100 with min function. Some with >500. | MIN(100/([Enterprise Value/EBITDA]),100) | **Not Good.** Need to improve. Useful for Value Composites. |
| ~~EBITDA/EV\_Max100\_NA\_50~~ | Inverse of EV/EBITDA; multiplly with100; limit to 100. Use 50 for NA. My version of % rank for O'S. | (IIF(IsFieldNull([EBITDA/EV\_Max100])=0,50,[EBITDA/EV\_Max100])) | **Not Good.** Need to improve. Useful for Value Composites. |
| EnhBookValuePS | Enhanced Book Value; used to ID value companies in Growth companies with high P/B (low %Rank\_P/B\_NA- | [Book value/share Y1] + ([Mult] \* ([R&D\_EBV]+[Brand\_EBV]+[Prop\_EBV])/[Shares Average Q1]) | Used to create ValComp\_1N in value composites – in lieu of traditional book value |
| ~~FCF2~~ | Free Cash Flow 2 /Sh = (EBITDA - DeltaWC - Cap Expenditure)/ # of shares Agri paper ref | ([EBIT Y1] + [Depreciation Y1]- [DettaWorkingCapital] - [Capital expenditures Y1])/ [Shares Average Q1] | **Confusing**. Do not use it! Deleted. |
| FCFE | Free Cash Flow to Equity/share; Richardson defn; Bettter Vs EBITDA and FCF; Found in Agri bus paper | ([EBITDA Y1] - [Depreciation Y1] - [TotalAccrual])/[Shares Average Q1] | Used in lieu of Cash Flow in computing ValComp\_2N and ValComp\_4N in value composites. |
| FCFE\_Neg‑Flag | FCFE is negative | IIF([FCFE]<0, 1,0) | Used in Avoidance Screen |
| FINA\_Y1 | Financial Assets in Y1, used in Total Accrual. | [Short-term investments Y1] + [Long-term investments Y1] | Used in calculating TACC |
| FINA\_Y2 | Financial Assets in Y2, used in Total Accrual. | [Short-term investments Y2] + [Long-term investments Y2] | Used in calculating TACC |
| **FinComp\_1** (%FinComp1Inv in Excel) | Debt to Equity. Low is good. | ([Long-term debt Y1]+[Short-term debt Y1]+[Preferred stock Y1])/[Equity (common) Y1] | Used in Financial Composite- Low is good. |
| **FinComp\_2** (%FinComp2Inv in Excel) | % change in Debt. Low is good. | IIF(([FINL\_Y2]> 0), 100\* ( ([FINL\_Y1]/[FINL\_Y2]) - 1) , 0 ) | Used in Financial Composite - Low is good. |
| **FinComp\_3** (%FinComp3Inv in Excel) | External Financing. Low is good. | ([Cash from financing Y1]/(0.5\*([Total assets Y1]+[Total assets Y2])) | Used in Financial Composite - Low is good. |
| **FinComp\_4** (%FinComp4 in Excel) | Cash Flow to Debt Ratio. High is good | IIF(([Current liabilities Y1]> 0), 100\* (([Cash Y1]+[Short-term investments Y1])/[Current liabilities Y1]) , 100 ) | Used in Financial Composite - high is good. |
| **FinComp\_4N -** NEW, my addition(%FinComp5 in Excel) | FCFE to Debt Ratio. High is good. | IIF(([Current liabilities Y1]> 0), 100\* (([FCFE])/[Current liabilities Y1]) , 100 ) | My addition to Financial Composite - high is good |
| FINL\_Y1 | Financial Liabilities for Y1, used in Total Accrual | [Short-term debt Y1] + [Long-term debt Y1] + [Preferred stock Y1] | Used in calculating TACC |
| FINL\_Y2 | Financial Liabilities for Y2, used in Total Accrual | [Short-term debt Y2] + [Long-term debt Y2] + [Preferred stock Y2] | Used in calculating TACC |
| FIN\_Y1 | Net Financial Assets for Y1, used in total Accruals | [FINA\_Y1] - [FINL\_Y1] | Used in calculating TACC |
| FIN\_Y2 | Net Financial Assets for Y2, used in total Accruals | [FINA\_Y2] - [FINL\_Y2] | Used in calculating TACC |
| Fraul\_Prescr\_Partial | Fraud screen: Chck SEC letter if this value > 2.5 | Sum of QualofBadFlags for Assets, earnings, and revenue, and Zbadintflag. | Set Fraud Flag if this score>2.5 and SEC letter has been sent. |
| Mult | Mult = 0.5 for -99%, 1 for 0%, 1.5 for 99%; Mult used in O'S EBV | ([Shareholder Yield-1 year ago]/200) + 1 | Used in calculating Enhanced Book Value |
| NCOA\_Y1 | Noncurrent Operating Assets for Y1. Used in Total Accrual Calculation | [Total assets Y1]-[Current assets Y1]-[Long-term investments Y1] | Used in calculating TACC |
| NCOA\_Y2 | Noncurrent Operating Assets for Y2. Used in Total Accrual Calculation | [Total assets Y2]-[Current assets Y2]-[Long-term investments Y2] | Used in calculating TACC |
| NCOL\_Y1 | NonCurrent Operating Liabilities, for Y1, used in Total Accrual calculation | [Total liabilities Y1]- [Current liabilities Y1]-[Long-term debt Y1] | Used in calculating TACC |
| NCOL\_Y2 | NonCurrent Operating Liabilities, for Y2, used in Total Accrual calculation | [Total liabilities Y2]- [Current liabilities Y2]-[Long-term debt Y2] | Used in calculating TACC |
| NCO\_Y1 | Net NonCurrent Operating Assets for Y1 = Noncurrent Operating Assets - NonCurrent Operating Liabilit | [NCOA\_Y1] -[NCOL\_Y1] | Used in calculating TACC |
| NCO\_Y2 | Net NonCurrent Operating Assets for Y2 = Noncurrent Operating Assets - NonCurrent Operating Liabilit | [NCOA\_Y2] - [NCOL\_Y2] | Used in calculating TACC |
| NOA\_Y1 | Net Operating Assets Y1; NOA\_Y1 = OA\_Y1 - OL\_Y1 | [OA\_Y1] - [OL\_Y1] | Used in calculating AccComp\_2 |
| NOA\_Y2 | Net Operating Assets Y2; NOA\_Y2 = OA\_Y2 - OL\_Y2 | [OA\_Y2] - [OL\_Y2] | Used in calculating AccComp\_2 |
| OA\_Y1 | Operating Assets; OA\_Y1 = (ASSETS\_Y1 - CASH\_Y1) | [Total assets Y1]-[Cash Y1] | Used in calculating AccComp\_2 |
| OA\_Y2 | Operating Assets; OA\_Y2 = (ASSETS\_Y2 - CASH\_Y2) | [Total assets Y2]-[Cash Y2] | Used in calculating AccComp\_2 |
| OL\_Y1 | Operating Liabilities; OL\_Y1 =( LIAB\_Y1 - (STINV\_Y1 + LTINV\_Y1)) | [Total liabilities Y1] - ([Short-term investments Y1] + [Long-term investments Y1]) | Used in calculating AccComp\_2 |
| OL\_Y2 | Operating Liabilities; OL\_Y2 =( LIAB\_Y2 - (STINV\_Y2 + LTINV\_Y2)) | [Total liabilities Y2] - ([Short-term investments Y2] + [Long-term investments Y2]) | Used in calculating AccComp\_2 |
| **~~P/B\_EnhValue~~** | Used in O'S Article, to ID value stocks among 'Growth Stocks,' or veiled value stocks | [Price]/[EnhBookValuePS] | To be used in VC1N-VC3N. No need for this. Delete. Was calculated directly. |
| **~~PB\_NA\_Flag~~** | NA Flag for Price to Book | IsFieldNull([% Rank-Price/Book]) | Used in VC1-VC3. Delete. Not needed. |
| Price\_Change\_3mo | % Price change in 3 months; to be used in Price Momentum | 100 \* ([Price M001]-[Price M004])/ [Price M004] | Used in Momentum Composite. Select > med |
| Price\_Change\_5Yrs\_Abs | Price change in 5 years; Used to calculate Price Momentum; Pick low value in Price Momentum calculat | ABS(100 \* ([Price M001] - [Price M060])/[Price M060]) | Used in Momentum Composite. Select <30% |
| Price\_Change \_6mo | % Price change in 6 months; to be used in Price Momentum | 100 \* ([Price M001]-[Price M007])/ [Price M007] | Used in Momentum Composite; Select > med |
| Price\_Volatility\_12mo\_Abs | (Max - Min) / (Max + Min) as a percentage. Used % Rank for 12 months; 6 months data not availale; to | ABS(100\* ([% Rank-Price--high 52 week] - [% Rank-Price--low 52 week])/ ([% Rank-Price--high 52 week] + [% Rank-Price--low 52 week])) | Used in Momentum Composite. Select < median |
| Prop\_EBV | Real Estate or Prop Value - using Dep & Amor instead; used in O'S Enhanced Book Value. | ([Depreciation Y1]+[Depreciation Y2]+[Depreciation Y3]+[Depreciation Y4]+[Depreciation Y5])/5 | Used in Enh Book Value |
| QualOfAssets\_Bad\_Flag |  | if AccComp\_1<1 + TACC-BadFlag is set. | Used in Fraud Screen |
| QualOfEarnings\_Bad\_Flag |  | Flag is set if ratio <1 | Used in Fraud Screen |
| QualOfRevenue\_Bad\_Flag |  | Flag is set if ratio <1 | Used in Fraud Screen |
| R&D\_EBV | Research Asset. Capitalize R&D expenses and depreciate them over 5 years (O's use i n EBV). | ([Research and development Y1] +[Research and development Y2] + [Research and development Y3] + [Research and development Y4] + [Research and development Y5] )/5 | Used in Enh Book Value |
| ~~ShareholderYld\_Min\_0\_NA\_0~~ | Shareholder yield - low end is min of 0; NA is now 0. My version of % rank of O'S. 20% assumed to be max | (IIF(IsFieldNull((MAX([Shareholder Yield-1 year ago],0)))=0,0,(MAX([Shareholder Yield-1 year ago],0))) ) \* 100/20 | Used in Enh Book Value |
| ~~ShareholderYld\_Min\_0+NA\_50~~ |  |  | Used in Enh Book Value |
| TotalAccrual | Total Accrual = Change in (working Capital + net curent operating assets + financial assets) | [DettaWorkingCapital] + [DeltaNetNonCurrOpAssets] + [DeltaNetFinlAssets] | Used in (Value), Accounting, and (Financial0, and Fraud Composites. And FCFE |
| TACC\_Bad\_Flag | Some ‘growth’ companies may take on too much loan. | IIF(([DeltaNetFinlAssets]+[DeltaNetNonCurrOpAssets]) > 0.7 \* [TotalAccrual], 1,0) | Used in Avoidance Screen |
| Trading\_Volume\_Dollars | Six month average from Sum of (Monthly Price Close \* Monthly Trading Volume) | ([Price M001] \* [Price--Volume M001] + [Price M002] \* [Price--Volume M002] + [Price M003] \* [Price--Volume M003] + [Price M004] \* [Price--Volume M004] + [Price M005] \* [Price--Volume M005] + [Price M006] \* [Price--Volume M006])/6 | Used in Momentum Composite; Select < median |
| **ValComp\_1 (%**P/BInv in Excel) | %Rank\_P/B with NA at 50. Low is good. Inv ranking after export | (IIF(IsFieldNull([% Rank-Price/Book])=0,50,[% Rank-Price/Book])) | Used in O'S Value Factors; If Null, uses 50; low is good |
| **ValComp\_1N** (%P/EBVInv in Excel) | P/EBV. Do Inv ranking in Excel. Low is good | P/EBV; Make NA = median in % Ranks. | Low is good. EBV is custom. *Take P-Qtr Avg?* |
| **ValComp\_2** (%P/CFInv in Excel) | %Rank\_P/CF with NA at 50. Low is good. Inv ranking after export | (IIF(IsFieldNull([% Rank-Price/CFPS])=0,50,[% Rank-Price/CFPS])) | Used in O'S Value Factors; If Null, puts 50;  **Low is good.** |
| **ValComp\_2N** (%P/FCFEInv in Excel) | P/FCFE. Do Inv ranking in Excel - NA = median. Low is good. | If FCFE>0, P/FCFE; Else 100. Make NA = median in %Ranks. | Low is good. FCFE is custom. *Take P - Qtr Avg?* |
| **ValComp\_3** (%P/EInv in Excel) | %Rank\_P/E with NA at 50. Low is good. Inv ranking after export. | (IIF(IsFieldNull([% Rank-PE])=0,50,[% Rank-PE])) | Used in O'S Value Factors; If Null, puts 50; Low is good |
| **ValComp\_4** (%EV/EBITDAInv in Excel) | %Rank not avail in SIP. Do Inv ranking in Excel. Low is good in SIP | EV/EBITDA. Low is good. | Low is good. |
| **ValComp\_4N** (%EV/FCFEInv in Excel) | Do Inv ranking in Excel. Make NA=median. Low is good. | if FCFE >0, EV/FCFE; Else 100. Make NA = median in %Ranks. | Low is good is SIP; FCFE is custom. *Take P-Qtr avg?* |
| **ValComp\_5** (%P/SInv in Excel) | %Rank\_P/S with NA at 50. Low is good. Inv ranking in Excel. | (IIF(IsFieldNull([% Rank-Price/Sales])=0,50,[% Rank-Price/Sales])) | Used in O'S Value Factors; If Null, puts 50; Low is good. |
| **ValComp\_6** (%ShYld in Excel) - *Do not invert ranking.* | %Rank not avail in SIP. Do the ranking in Excel. Do not invert like others. | Share holder Yield. | High is good. Available in SIP. |
| ~~Value Factor 1(O’S) -~~ Replaced with ‘Value Prescreen’ | Sum of VC1 ranks - B/P, E/P, S/P, CF/P and EBITDA/EV | [%Rank\_B/P\_NA\_50]+[%Rank\_E/P\_NA\_50]+[%Rank\_S/P\_NA\_50]+[%Rank\_CF/P\_NA\_50] | Dropped EBITDA/EV\_Max100\_NA as it was not %rank. Others are %ranks - high is good. |
| ~~VC1A~~ | ~~VC1 minus EBITDA/EV rank. This is NOT VC1A.~~ | ~~([% Rank-Price/Book] +[% Rank-PE] + [% Rank-Price/Sales]+[% Rank-Price/CFPS])~~ | **~~Wrong calculation. ALERT! Delete~~** |
| Z-Bad\_Int\_Flag | Altman Z < 3 may file for bankruptcy in one year. | 0.5 for 1.8 to 3; 1 for <`1.8. 0 otherwise. |  |

Note - Keep for an initial screen - %Rank\_B/P\_NA\_50, and similar ones for S/P, CF/P, and E/P , Value Factor 1(O’S). **Delete:** VC1A. Replace ValueFactor1(O’S) with ‘Value Prescreen’.

To Add: (VC1A (new and correct), VC2A, VC3A), and (VC1AN, VC2AN, and VC3AN) – the new versions with EnhBookValue and FCFE used. Note: There is an “A” at the end of these to indicate that some of the items are not available in SIP as % ranks. I need to upload the raw values to Excel spreadsheet and calculate the % ranks and then calculate VC1 etc.

Also to Add: The sub components and final form of Fraud and Momentum Composites.

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