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| **Acronym** | **Paper’s author(s)** | **Date, Journal** | **Definition of the characteristic-based anomaly variable** |
| *absacc* | Bandyopadhyay, Huang & Wirjanto | 2010, WP | Absolute value of *acc.* |
| *acc* | Sloan | 1996, TAR | Annual income before extraordinary items (*ib*) minus operating cash flows (*oancf*) divided by average total assets (*at*); if *oancf* is missing then set to change in *act* - change in *che* - change in *lct* + change in *dlc* + change in *txp-dp*. |
| *aeavol* | Lerman, Livnat & Mendenhall | 2007, WP | Average daily trading volume (*vol*) for 3 days around earnings announcement minus average daily volume for 1-month ending 2 weeks before earnings announcement divided by 1-month average daily volume. Earnings announcement day from Compustat quarterly (*rdq*). |
| *age* | Jiang, Lee & Zhang | 2005, RAS | Number of years since first Compustat coverage. |
| *agr* | Cooper, Gulen & Schill | 2008, JF | Annual percent change in total assets (*at*). |
| *baspread* | Amihud & Mendelson | 1989, JF | Monthly average of daily bid-ask spread divided by average of daily spread. |
| *beta* | Fama & MacBeth | 1973, JPE | Estimated market beta from weekly returns and equal weighted market returns for 3 years ending month *t*-1 with at least 52 weeks of returns. |
| *betasq* | Fama & MacBeth | 1973, JPE | Market beta squared. |
| *bm* | Rosenberg, Reid & Lanstein | 1985, JPM | Book value of equity (*ceq*) divided by end of fiscal-year-end market capitalization. |
| *bm\_ia* | Asness, Porter & Stevens | 2000, WP | Industry adjusted book-to-market ratio. |
| *cash* | Palazzo | 2012, JFE | Cash and cash equivalents divided by average total assets. |
| *cashdebt* | Ou & Penman | 1989, JAE | Earnings before depreciation and extraordinary items (*ib*+*dp*) divided by avg. total liabilities (*lt*). |
| *cashpr* | Chandrashekar & Rao | 2009, WP | Fiscal year end market capitalization plus long term debt (*dltt*) minus total assets (*at*) divided by cash and equivalents (*che*). |
| *cfp* | Desai, Rajgopal & Venkatachalam | 2004, TAR | Operating cash flows divided by fiscal-year-end market capitalization. |
| *cfp\_ia* | Asness, Porter & Stevens | 2000, WP | Industry adjusted *cfp*. |
| *chatoia* | Soliman | 2008, TAR | 2-digit SIC - fiscal-year mean adjusted change in sales (*sale*) divided by average total assets (*at*). |
| *chcsho* | Pontiff & Woodgate | 2008, JF | Annual percent change in shares outstanding (*csho*). |
| *chempia* | Asness, Porter & Stevens | 1994, WP | Industry-adjusted change in number of employees. |
| *chfeps* | Hawkins, Chamberlin & Daniel | 1984, FAJ | Mean analyst forecast in month prior to fiscal period end date from I/B/E/S summary file minus same mean forecast for prior fiscal period using annual earnings forecasts. |
| *chinv* | Thomas & Zhang | 2002, RAS | Change in inventory (*inv*) scaled by average total assets (*at*). |
| *chmom* | Gettleman & Marks | 2006, WP | Cumulative returns from months *t*-6 to *t*-1 minus months *t*-12 to *t*-7. |
| *chnanalyst* | Scherbina | 2007, WP | Change in *nanalyst* from month *t*-3 to month *t*. |
| *chpmia* | Soliman | 2008, TAR | 2-digit SIC - fiscal-year mean adjusted change in income before extraordinary items (*ib*) divided by sales (*sale*). |
| *chtx* | Thomas & Zhang | 2011, JAR | Percent change in total taxes (*txtq*) from quarter *t*-4 to *t*. |
| *cinvest* | Titman, Wei & Xie | 2004, JFQA | Change over one quarter in net PP&E (*ppentq*) divided by sales (*saleq*) - average of this variable for prior 3 quarters; if *saleq* = 0, then scale by 0.01. |
| *convind* | Valta | 2016, JFQA | An indicator equal to 1 if company has convertible debt obligations. |
| *currat* | Ou & Penman | 1989, JAE | Current assets / current liabilities. |
| *depr* | Holthausen & Larcker | 1992, JAE | Depreciation divided by PP&E. |
| *disp* | Diether, Malloy & Scherbina | 2002, JF | Standard deviation of analyst forecasts in month prior to fiscal period end date divided by the absolute value of the mean forecast; if *meanest* = 0, then scalar set to 1. Forecast data from I/B/E/S summary files. |
| *divi* | Michaely, Thaler & Womack | 1995, JF | An indicator variable equal to 1 if company pays dividends but did not in prior year. |
| *divo* | Michaely, Thaler & Womack | 1995, JF | An indicator variable equal to 1 if company does not pay dividend but did in prior year. |
| *dolvol* | Chordia, Subrahmanyam & Anshuman | 2001, JFE | Natural log of trading volume times price per share from month *t*-2. |
| *dy* | Litzenberger & Ramaswamy | 1982, JF | Total dividends (*dvt*) divided by market capitalization at fiscal year-end. |
| *ear* | Kishore, Brandt, Santa-Clara & Venkatachalam | 2008, WP | Sum of daily returns in three days around earnings announcement. Earnings announcement from Compustat quarterly file (*rdq*). |
| *egr* | Richardson, Sloan, Soliman & Tuna | 2005, JAE | Annual percent change in book value of equity (*ceq*). |
| *ep* | Basu | 1977, JF | Annual income before extraordinary items (*ib*) divided by end of fiscal year market cap. |
| *fgr5yr* | Bauman & Dowen | 1988, FAJ | Most recently available analyst forecasted 5-year growth. |
| *gma* | Novy-Marx | 2013, JFE | Revenues (*revt*) minus cost of goods sold (*cogs*) divided by lagged total assets (at*).* |
| *grCAPX* | Anderson & Garcia-Feijoo | 2006, JF | Percent change in capital expenditures from year *t*-2 to year *t*. |
| *grltnoa* | Fairfield, Whisenant & Yohn | 2003, TAR | Growth in long term net operating assets. |
| *herf* | Hou & Robinson | 2006, JF | 2-digit SIC - fiscal-year sales concentration (sum of squared percent of sales in industry for each company). |
| *hire* | Bazdresch, Belo & Lin | 2014, JPE | Percent change in number of employees (*emp*). |
| *idiovol* | Ali, Hwang & Trombley | 2003, JFE | Standard deviation of residuals of weekly returns on weekly equal weighted market returns for 3 years prior to month end. |
| *ill* | Amihud | 2002, JFM | Average of daily (absolute return / dollar volume). |
| *indmom* | Moskowitz & Grinblatt | 1999, JF | Equal weighted average industry 12-month returns. |
| *invest* | Chen & Zhang | 2010, JF | Annual change in gross property, plant, and equipment (*ppegt*) + annual change in inventories (*invt*) all scaled by lagged total assets (*at*). |
| *IPO* | Loughran, Ritter & Ritter | 1995, JF | An indicator variable equal to 1 if first year available on CRSP monthly stock file. |
| *lev* | Bhandari | 1988, JF | Total liabilities (lt*)* divided by fiscal year end market capitalization. |
| *lgr* | Richardson, Sloan, Soliman & Tuna | 2005, JAE | Annual percent change in total liabilities (*lt*). |
| *maxret* | Bali, Cakici & Whitelaw | 2011, JFE | Maximum daily return from returns during calendar month *t*-1. |
| *mom12m* | Jegadeesh | 1990, JF | 11-month cumulative returns ending one month before month end. |
| *mom1m* | Jegadeesh & Titman | 1993, JF | 1-month cumulative return. |
| *mom36m* | Jegadeesh & Titman | 1993, JF | Cumulative returns from months *t*-36 to *t*-13. |
| *mom6m* | Jegadeesh & Titman | 1993, JF | 5-month cumulative returns ending one month before month end. |
| *ms* | Mohanram | 2005, RAS | Sum of 8 indicator variables for fundamental performance. |
| *mve* | Banz | 1981, JFE | Natural log of market capitalization at end of month *t*-1. |
| *mve\_ia* | Asness, Porter & Stevens | 2000, WP | 2-digit SIC industry-adjusted fiscal year-end market capitalization. |
| *nanalyst* | Elgers, Lo & Pfeiffer | 2001, TAR | Number of analyst forecasts from most recently available I/B/E/S summary files in month prior to month of portfolio formation. *nanalyst* set to zero if not covered in I/B/E/S summary file. |
| *nincr* | Barth, Elliott & Finn | 1999, JAR | Number of consecutive quarters (up to eight quarters) with an increase in earnings (*ibq*) over same quarter in the prior year. |
| *operprof* | Fama & French | 2015, JFE | Revenue minus cost of goods sold - SG&A expense - interest expense divided by lagged common shareholders' equity. |
| *orgcap* | Eisfeldt & Papanikolaou | 2013, JF | Capitalized SG&A expenses. |
| *pchcapx\_ia* | Abarbanell & Bushee | 1998, TAR | 2-digit SIC - fiscal-year mean adjusted percent change in capital expenditures (*capx*). |
| *pchcurrat* | Ou & Penman | 1989, JAE | Percent change in *currat.* |
| *pchdepr* | Holthausen & Larcker | 1992, JAE | Percent change in *depr.* |
| *pchgm\_pchsale* | Abarbanell & Bushee | 1998, TAR | Percent change in gross margin (*sale*-*cogs*) minus percent change in sales (*sale*). |
| *pchquick* | Ou & Penman | 1989, JAE | Percent change in *quick.* |
| *pchsale\_pchinvt* | Abarbanell & Bushee | 1998, TAR | Annual percent change in sales (*sale*) minus annual percent change in inventory (*invt*). |
| *pchsale\_pchrect* | Abarbanell & Bushee | 1998, TAR | Annual percent change in sales (*sale*) minus annual percent change in receivables (*rect*). |
| *pchsale\_pchxsga* | Abarbanell & Bushee | 1998, TAR | Annual percent change in sales (*sale*) minus annual percent change in SG&A (*xsga*). |
| *pchsaleinv* | Ou & Penman | 1989, JAE | Percent change in *saleinv.* |
| *pctacc* | Hafzalla, Lundholm & Van Winkle | 2011, TAR | Same as *acc* except that the numerator is divided by the absolute value of *ib*; if *ib* = 0 then *ib* set to 0.01 for denominator. |
| *pricedelay* | Hou & Moskowitz | 2005, RFS | The proportion of variation in weekly returns for 36 months ending in month *t* explained by 4 lags of weekly market returns incremental to contemporaneous market return. |
| *ps* | Piotroski | 2000, JAR | Sum of 9 indicator variables to form fundamental health score. |
| *quick* | Ou & Penman | 1989, JAE | (current assets - inventory) / current liabilities. |
| *rd* | Eberhart, Maxwell & Siddique | 2004, JF | An indicator variable equal to 1 if R&D expense as a percentage of total assets has an increase greater than 5%. |
| *rd\_mve* | Guo, Lev & Shi | 2006, JBFA | R&D expense divided by end-of-fiscal-year market capitalization. |
| *rd\_sale* | Guo, Lev & Shi | 2006, JBFA | R&D expense divided by sales (*xrd*/*sale*). |
| *realestate* | Tuzel | 2010, RFS | Buildings and capitalized leases divided by gross PP&E. |
| *retvol* | Ang, Hodrick, Xing & Zhang | 2006, JF | Standard deviation of daily returns from month *t*-1. |
| *roaq* | Balakrishnan, Bartov & Faurel | 2010, JAE | Income before extraordinary items (*ibq*) divided by one quarter lagged total assets (*atq*). |
| *roavol* | Francis, LaFond, Olsson & Schipper | 2004, TAR | Standard deviaiton for 16 quarters of income before extraordinary items (*ibq*) divided by average total assets (*atq*). |
| *roeq* | Hou, Xue & Zhang | 2014, RFS | Earnings before extraordinary items divided by lagged common shareholders' equity. |
| *roic* | Brown & Rowe | 2007, WP | Annual earnings before interest and taxes (*ebit*) minus non-operating income (*nopi*) divided by non-cash enterprise value (*ceq*+*lt*-*che*). |
| *rsup* | Kama | 2009, JBFA | Sales from quarter t minus sales from quarter *t*-4 (*saleq*) divided by fiscal-quarter-end market capitalization (*cshoq* \* *prccq*). |
| *salecash* | Ou & Penman | 1989, JAE | Annual sales divided by cash and cash equivalents. |
| *saleinv* | Ou & Penman | 1989, JAE | Annual sales divided by total inventory. |
| *salerec* | Ou & Penman | 1989, JAE | Annual sales divided by accounts receivable. |
| *secured* | Valta | 2016, JFQA | Total liability scaled secured debt. |
| *securedind* | Valta | 2016, JFQA | An indicator equal to 1 if company has secured debt obligations. |
| *sfe* | Elgers, Lo & Pfeiffer | 2001, TAR | Analysts mean annual earnings forecast for nearest upcoming fiscal year from most recent month available prior to month of portfolio formation from I/B/E/S summary files scaled by price per share at fiscal quarter end. |
| *sgr* | Lakonishok, Shleifer & Vishny | 1994, JF | Annual percent change in sales (*sale*). |
| *sin* | Hong & Kacperczyk | 2009, JFE | An indicator variable equal to 1 if a company's primary industry classification is in smoke or tobacco, beer or alcohol, or gaming. |
| *SP* | Barbee, Mukherji, & Raines | 1996, FAJ | Annual revenue (*sale*) divided by fiscal-year-end market capitalization. |
| *std\_dolvol* | Chordia, Subrahmanyam & Anshuman | 2001, JFE | Monthly standard deviation of daily dollar trading volume. |
| *std\_turn* | Chordia, Subrahmanyam, &Anshuman | 2001, JFE | Monthly standard deviation of daily share turnover. |
| *stdacc* | Bandyopadhyay, Huang & Wirjanto | 2010, WP | Standard deviation for 16 quarters of accruals (*acc* measured with quarterly Compustat) scaled by sales; if *saleq* = 0, then scale by 0.01. |
| *stdcf* | Huang | 2009, JEF | Standard deviation for 16 quarters of cash flows divided by sales (*saleq*); if *saleq* = 0, then scale by 0.01. Cash flows defined as *ibq* minus quarterly accruals. |
| *sue* | Rendelman, Jones & Latane | 1982, JFE | Unexpected quarterly earnings divided by fiscal-quarter-end market cap. Unexpected earnings is I/B/E/S actual earnings minus median forecasted earnings if available, else it is the seasonally differenced quarterly earnings before extraordinary items from Compustat quarterly file. |
| *tang* | Almeida & Campello | 2007, RFS | Cash holdings + 0.715 × receivables + 0.547 × inventory + 0.535 × PPE/ total assets. |
| *tb* | Lev & Nissim | 2004, TAR | Tax income, calculated from current tax expense divided by maximum federal tax rate, divided by income before extraordinary items. |
| *turn* | Datar, Naik & Radcliffe | 1998, JFM | Average monthly trading volume for most recent 3 months scaled by number of shares outstanding in current month. |
| *zerotrade* | Liu | 2006, JFE | Turnover weighted number of zero trading days for most recent 1 month. |