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A TWO-STEP METHOD FOR ASSESSING ENHANCED VALUE IN TURNAROUND, SPIN-OFF, AND VALUE STOCKS

Abstract

To assess outright and relative value opportunities in stocks and benchmark their performance against an index with global relevance, it is important to achieve and measure risk-adjusted excess returns. Academic and corporate research has focused quite extensively on analyzing stock returns and comparing the outperformance of specific investment strategies, with value investing being one of the most prominent and longest-known factor strategies. In this event study, to test for the existence of risk-adjusted excess returns, or alpha, a novel two-step approach is proposed to assess Enhanced Value in single stocks for three different investment approaches: plain value investing, investing in spin-offs, and investing in turnaround companies. While the first step of the two-step approach screens companies for a combination of financial company characteristics, the second step ranks and sorts them by either their price-earnings ratio or by their price-book ratio, thus "enhancing" the value assessment. Their short- and mid-term stock performance is investigated for an investment horizon of one year, three years, and five years. Stocks of value companies, spin-offs, and turnaround companies outperform the S&P 500 benchmark on average and on a risk-adjusted basis for all three investment horizons when tested for Enhanced Value with the novel two-step approach. The analysis results provide deeper insights into how the value factor in its different characteristics needs to be understood in the context of investment strategies and how it potentially can be applied to stock selection and portfolio construction, resulting in investment strategies showing a risk-adjusted outperformance.

Keywords factor investing, value investing, spin-off, turnaround, risk premium, alpha, benchmarking

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INTRODUCTION

Academic and corporate research has long focused on analyzing stock returns, financial markets, and investment strategies. Factor investing, which identifies specific risk-return factors linked to positive risk premiums or risk-adjusted excess returns, has been shown to enhance investment portfolio returns and outperform broader markets (Enow, 2023). Prominent factors include market, value, size, and momentum (Fama & French, 1992; Bender, 2013; Moskowitz et al., 2012; Brock et al., 1992; Levine & Pedersen, 2016; Hamdan et al., 2016).

Studies indicate that value stocks outperform growth stocks and market indices over one year (Graham & Dodd, 1934; Lakonishok et al., 1994; Bauman et al., 1998; Cheng & Wang, 2014). To screen for value stocks, a combination of both low price-to-earnings (P/E) and price-to-book (P/B) valuations poses a superior selection approach than either method alone (Cheng & McNamara, 2000).

Evidence of value and momentum return premia exists across markets such as the US, UK, continental Europe, and Japan (Asness et al.,

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2013). Value strategies correlate positively with other value strategies globally and negatively with momentum strategies. Premia are larger among smaller, less liquid stocks.

However, former studies have focused on investment periods up to three years post-spin-off, with little research on risk-adjusted returns beyond this horizon. This study introduces a novel two-step approach to assess Enhanced Value in single stocks. It extends the investment period to five years, using the capital asset pricing model (CAPM) to analyze short-term and mid-term stock performance and risk-adjusted excess returns for value stocks, spin-offs, and turnaround stocks.

1. LITERATURE REVIEW

The P/E ratio poses a common valuation method that sets a company's stock price in relation to its earnings (Alford, 1992). Bodie et al. (2017) define the P/E ratio with the following equation:

$$\frac{P}{E}=\frac{Market\ capitalization}{Earnings}. \quad (1)$$

A P/E ratio below 15 is traditionally considered inexpensive (Graham, 1959).

The P/B ratio is obtained by dividing the company's market capitalization by its book value:

$$\frac{P}{B}=\frac{Market\ capitalization}{Book\ Value}. \quad (2)$$

The CAPM was introduced by Treynor (1961), Sharpe (1964), Lintner (1965), and Mossin (1966) based on earlier research from Markowitz (1959). Numerous financial studies have covered performance measures within CAPM (see Treynor, 1965; Jensen, 1968; Sharpe, 1994; Modigliani & Modigliani, 1997; Bali et al., 2016). The CAPM predicts the linear relationship between the market risk premium (being the difference between the expected return of the market portfolio and the risk-free rate) scaled by the systemic risk factor beta and the expected return of a portfolio:

$$E(R_p)=R_f+\beta_p[E(R_m)-R_f], \quad (3)$$

where $E(R_p)$ – expected return of portfolio p; R_f – risk-free rate; $E(R_m)$ – expected return of the market portfolio; β_p – $Cov\ (R_p, R_m)/\sigma^2(R_p)$ beta coefficient of portfolio p.

$E(R_m) - R_f$ is the market risk premium, and β_p is calculated by dividing the covariance between the market portfolio m and the portfolio p by the variance of the market portfolio, accounting for portfolio p's systematic risk (Bodie et al., 2017). However, while CAPM concerns itself with expected returns and the calculated beta, this study analyzes actual returns employing estimated betas.

Jensen's alpha (Jensen, 1968) is a risk-adjusted performance metric based on CAPM that measures how a portfolio's actual performance differs from the expected return. A positive alpha α asserts that an investment has outperformed the expected (required) return, a negative alpha that a portfolio p has underperformed. The alpha should be zero if the CAPM holds (Hübner, 2005).

$$\begin{aligned} a_p &= R_p - E(R_p) \\ &= R_p - R_f - \beta_p[E(R_m) - R_f], \end{aligned} \quad (4)$$

where $E(Rp)$ – expected return of portfolio p; R_p – return of portfolio p; R_f – risk-free rate; $E(R_m)$ – expected return of the market portfolio; β_p – $Cov\ (R_p, R_m)/\sigma^2(R_p)$ beta coefficient of portfolio p; and:

- $a_p > 0$, the portfolio outperforms the expected return of the CAPM benchmark,
- $a_p < 0$, the portfolio underperforms the expected return of the CAPM benchmark.

The Treynor, or reward-to-volatility ratio, provides a performance metric to measure the excess return by each unit of systematic risk a portfolio takes (Treynor, 1965). A high Treynor ratio implies a portfolio has obtained more excess return with the systematic risk taken:

$$\begin{aligned} &Treynor\ ratio(T) \\ &= \frac{Excess\ return}{Risk} = \frac{R_p - R_f}{\beta_p}, \end{aligned} \quad (5)$$

where R_p – return of portfolio p; R_f – risk-free rate; β_p – $Cov\ (R_p, R_m)/\sigma^2(R_p)$ beta coefficient of portfolio p.

Table 1. Average short-term 1-year excess return of value stocks

Authors	Year	Area	Period	1Y Return
Lakonishok et al.	1994	U.S.	1963–1990	19.8%
Bauman et al. (P/E sample)	1998	Global	1986–1996	15.3%
Bauman et al. (P/B sample)	1998	Global	1986–1996	17.1%
An et al. (EBIT/EV sample)	2017	U.S.	1999–2014	15.1%
An et al. (BV/EV sample)	2017	U.S.	1999–2014	16.1%

There is a profusion of approaches for assessing and measuring the value of a company, all of which have in common that they set the intrinsic value of the company concerning the market value by examining financial indicators and balance sheet information in one way or another. Lakonishok et al. (1994) divided stocks into deciles according to the book-to-market ratio (B/M), cash-flow-to-market value, P/E ratio, and five-year sales growth rate. They found that high-value stocks, as identified using these financial metrics, provide a superior return compared to popular stocks. This finding is confirmed by other studies (Chan et al., 1991; Fama & French, 1992; Bauman et al., 1998). An et al. (2017) suggest examining value stocks with earnings before interest and taxes (EBIT) divided by enterprise value (EV) ratio (EBIT/EV) and book value divided by enterprise value ratio (BV/EV) in the 75th percentile or above. EBIT removes the effect of changing interest and tax rates, thus delivering an advantage. Table 1 provides an overview of earlier research regarding the short-term returns of value stocks.

A spin-off is a corporate restructuring: the parent company separates one of its subsidiaries, which becomes an independently listed entity (Navatte & Schier, 2017). Shareholders of the pre-spin-off parent company remain owners of both entities (Bülow & Mjörnemark, 2019). Various studies have investigated the value creation for the parent company (Krishnaswami & Subramaniam, 1999; Bergh et al., 2008). Spin-offs entail an increased strategic focus by allowing the parent to concentrate on the core product and competencies (Tübke, 2004) and an accurate valuation of the parent company (Ammann et al., 2012). Furthermore, a spin-off transaction has no tax consequences for the divesting parent company (Veld & Veld-Merkoulova, 2009). According to Table 2, spin-off subsidiary stocks provide a positive short-term excess return. Nevertheless, McConnell et al. (2001) point out that the results displayed by Cusatis et al. (1993) depend to a large degree on the employed holding period. Moreover, Allen (2001) discloses that insider trades are notably related to post-spin-off stock returns, takeovers, and even delistings of spun-off companies.

A turnaround is the process of a company with a period of poor operating performance transitioning to a time of financial recovery. Pre-turnaround stocks, with a low price, are usually cheap to buy in the market. If a company manages to "turn around", its book value will appreciate, and its P/B ratio will become highly attractive to investors. If it fails to "turn around," its book value will adjust to zero, and the company will default. Thus, turn-

Table 2. Average short-term 1-year excess return of spin-off subsidiary stocks

Authors	Year	Area	Period	1Y Return
Cusatis et al.	1993	U.S.	1965–1988	4.5%
McConnell and Ovtchinnikov	2004	U.S.	1965–2000	19.4%
Veld and Veld-Merkoulova	2004	Europe	1987–2000	12.6%
McConnell et al.	2015	U.S.	2007–2014	8.5%
Bülow and Mjörnemark	2019	Global	2000–2015	15.3%

Table 3. Average short-term 1-year excess return of turnaround stocks

Authors	Year	Area	Period	1Y Return
Eberhart et al.	1999	U.S.	1980–1993	24.6-138.8%
Jory and Madura	2010	U.S.	1980–2006	–17.66-–0.37%*

Note: * With the first equally weighted and the latter being value-weighted adjusted compounded returns.

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around stocks can be viewed as extreme value opportunities, albeit with the inherent risk of default (the latter is known as the *value trap*; Penman & Reggiani, 2018). For this risk, investors can command a risk premium (Hamdan et al., 2016). Table 3 summarizes earlier research on the short-term excess return of turnaround stocks.

2. METHODOLOGY

In this study, a novel two-step approach is applied to assess Enhanced Value in single stocks for three different investment approaches, plain value investing, investing in spin-offs, and investing in turnaround companies, and to quantify their relative attractiveness:

Step One: Global stocks for each investment approach (value, spin-offs, and turnaround companies) between 2000 and 2019 are assessed with an individual pre-screening process.

Step Two: As per the investment approach, these pre-screened stocks are evaluated according to their relative attractiveness as assessed via their P/E and P/B ratios.

Thus, eight portfolios are analyzed for each of the three approaches that distinguish themselves with lower or higher multiples, totaling twenty-four portfolios overall. To assess the difference between the actual and expected return according to CAPM, as well as the alpha of the P/E and P/B portfolios, for all three investment horizons, a one-tailed two-sample Ordinary Least Square Method (OLS) t-test with the assumption of unequal variances is applied to the 24 portfolios at three significance levels of 10%, 5%, and 1%. The OLS is a common statistical tool for analyzing linear regressions (Nelling & Webb, 2009; Dang et al., 2018).

For each of the portfolios, the null hypothesis (H_0) and the alternative hypothesis (H_1) are:

$$H_0: \ a_p = 0, \tag{6a}$$

$$H_1: \ a_p > 0. \tag{6b}$$

H_0 asserts that the investment portfolios do not outperform the benchmark.

The data for this event study have been retrieved from Refinitiv. Unlike earlier studies that have concentrated solely on the U.S. market, this study includes global equities in the sample (see Table 6).

The stock market data cover a 20-year period between January 1, 2000 and December, 31 2019. The study shows the historical total returns (over one, three, and five years), three-year weekly beta, net income, total book capital, and market capitalization.

Each investment approach's holding period return (HPR) has been calculated as if an investor pursued a passive investment strategy over the respective investment horizon. Compared to earlier studies, the return period is enlarged to five years after the investment date *t*. The HPR of *t* + one, three, and five year(s) has been calculated for all three investment approaches. The HPR includes any value appreciation of the stock plus dividends for the specified period and is calculated as follows (Bodie et al., 2017):

$$HPR_{t+1} = \frac{P_{t+1} - P_t + D}{P_t} \tag{7}$$

where P_t – price at time *t*; *t* – year of investment; *D* – accumulated dividends.

Each investment return has been benchmarked against the performance of the S&P 500 index and the average annual 30-year U.S. treasury bond rate between 2000 and 2019 of 3.84 percent serves as the risk-free rate. Since most stocks in the data sample originate from the United States, the U.S. markets constitute the benchmark market.

Value stocks are often screened via low P/E and P/B ratios. In the novel two-step approach to assessing Enhanced Value, P/E, and P/B ratios are only resorted to in Step Two. The two-step approach follows Cheng and Wang (2014) in the broadest sense. Still, it differs because of the wider scope of application (spin-offs, turnarounds) significantly in methodological design and in the specific choice of indicators, i.e., a first assessment on a selection of pre-defined financial indicators, followed by relative ranking of ratios indicative of value.

In **Step One,** stocks are individually pre-screened for each of the three different investment approaches:

Value stocks: Value stocks are assessed that displayed a high value as shown by their applied profitability, leverage, cash flow, and liquidity. For an individual year, the process identifies value stocks with the following metrics in the previous year: market cap exceeding USD five billion, positive net income, cash ratio above one, debt/equity ratio below 150 percent, enterprise value to its earnings before interest, taxes, depreciation, and amortization ratio (EV/EBITDA) below ten, and Earnings Quality Model rank of above 80.

The Earnings Quality Model is a quantitative multi-factor approach that provides a percentile ranking of global stocks based on the sustainability of earnings. The ranking is scaled from zero to one hundred, while a country ranks from 80, implying that the company delivers more persistent and fundamental earnings than 80 percent of the companies in the country. High-scored companies are more likely to outperform their benchmark.

Earnings quality is interpreted as a measure of the degree to which past earnings are dependable and are likely to persist. High-quality earnings reflect a company's current and past operating performance (Refinitiv, 2022). Small companies are excluded from the sample, and a dedicated small-cap bias, as well as any associated overperformance, is thus avoided (see Small-Minus-Big (SMB) factor, Fama and French (1992)). Since net earnings had to be positive, with a sufficient cash ratio and lower debt/equity ratio, a general level of robustness is being provided.

However, there are limitations to the data sample: First, many companies, such as banks, were excluded through the leverage requirement in the screening. Second, the Earnings Quality Model did not include many companies from 2000–2005 with a score above 80.

Table 4 provides an overview of the screening criteria for value stocks, their explanation, and respective references.

Spin-off stocks: Spin-off transactions announced between January 2000 and December 2019 are included for which the deal value was disclosed and included in the Refinitiv database, covering spin-offs in the strict sense only. Variations have not been examined, as carve-outs constitute too small business units, usually not listed as a new entity but instead acquired by another company. To increase the sample size, announced spin-off transactions in 2019, effective only in 2020, were added.

The returns of spin-off subsidiaries are analyzed, considering only transactions with a rank value, including net debt of target, above USD 1.5 billion. The rank value is a common figure in M&A transactions and is calculated as follows:

$$\begin{aligned} &Rank\ Value\ Inclusive\ of\ Net\ Debt\ of\ Target \\ &= Transaction\ Value \\ &- Liabilities + Target's\ Net\ Debt, \end{aligned} \tag{8}$$

$$\begin{aligned} Net\ Debt &= Straight\ Debt \\ &+ Short - Term\ Debt \\ &+ Preferred\ Equity \\ &- Cash\ and\ Marketable\ Securities. \end{aligned} \tag{9}$$

Refinitiv only provides a rank value of the transaction when information regarding the company's balance sheet is available and the deal value is publicly disclosed. The rank value is defined as the amount paid by the acquirer for the target, including net debt, either published in the offer documentation or calculated as target short-term and long-term debt minus cash on the balance sheet and marketable securities.

Table 4. Description of screening criteria for value stocks

No.	Criterion	Explanation	Authors
1.	Market Capitalization	Exceeding USD five billion *	Oppenheimer (1984)
2.	Net Income	Positive net income to apply the P/E multiple	Lev and Nissim (2004)
3.	Cash Ratio	Above one excluding non-cash positions from current assets	Cheng and Wang (2014)
4.	Leverage	With Debt/Equity instead of Debt/Assets below 150 percent	Cheng and Wang (2014)
5.	EV/EBITDA	Should also be with capital B, as all other explanations start with capital letters. This is to guarantee consistency.	Muller (2019)
6.	Earnings Quality Model	Rank above 80 indicating that the company's earnings exceed 80 percent of the companies in the country.	Fassas et al. (2023)

Note: To be considered a value stock, all six criteria had to be met. * The filter "MCAP > USD 5bln" is a very common definition for large-cap stocks (see e.g., www.nasdaq.com/glossary/1/large-cap).

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Therefore, the rank value provides an appropriate proxy for the size of the transaction, which only includes the equity value and the net debt, while other non-financial liabilities that might be less important for spin-off transactions are excluded. By applying the rank value of targets above USD 1.5 billion, only larger spin-off transactions were considered, totaling 131 global spin-offs.

Some limitations regarding the sample quality exist: First, only companies with positive net earnings in the first year after the IPO have been considered, as positive net earnings were required to obtain a P/E ratio indicative of value. Second, numerous spin-off transactions had to be removed from the initial sample, as financial data has been unavailable in Refinitiv, the companies had negative earnings, or were delisted in years following the spin-off transaction. The returns for spun-off stocks have been calculated from the date the spin-off became effective, being the first time when shares were traded.

Turnaround stocks: Data regarding turnaround companies are difficult to compile since there is no clear definition of a turnaround. In previous studies on bankruptcy and turnaround firms, Altman's z-score was applied (Morse & Shaw, 1988; Griffin & Lemmon, 2002; Agarwal & Taffler, 2008). Based on five financial measures (profitability, leverage, liquidity, solvency, business activity), it is commonly used to determine if a company is likely to default within the following two years (Altman, 1968).

According to Oehninger et al. (2020), the z-score represents a reliable indicator of a possible impending financial crisis leading to default. Following Altman (2000), the z-score has a prediction accuracy between 82 and 94 percent one year before failure and 68 to 75 percent two years before failure.

$$Altman\ z-score = 1.2\ X_1 + 1.4\ X_2 + 3.3\ X_3 + 0.6\ X_4 + 1.0\ X_5, \quad (10)$$

where X_1 – working capital / total assets; X_2 – retained earnings / total assets; X_3 – EBIT / total assets; X_4 – market value of equity/total liabilities; X_5 – sales/total assets.

A score near zero implies that a company is close to bankruptcy, whereas a score of three or above suggests good financial health. Companies with a z-score below 1.80 are in financial distress. A score of 1.80 to 2.99 constitutes the grey zone. As the z-score is only calculated on an annual basis, the turnaround process of companies is explained over four years.

Consequently, companies in financial distress are defined as those with a z-score below 1.80 over four consecutive years. Successful turnaround companies have had a z-score below 1.80 in two consecutive years, followed by a z-score of above 1.80 in the third year and above 2.99 in the fourth, as Table 5 indicates.

Table 5. Z-score: definition of successful turnaround companies

Status	Year 1	Year 2	Year 3	Year 4
Failed Turnaround *	<1.80	<1.80	<1.80	<1.80
Successful Turnaround	<1.80	<1.80	>1.80	>2.99

Note: * Failed turnaround = financially distressed.

Only turnaround companies with a positive net income and a market capitalization exceeding one billion USD in year three, the year of investment, of the turnaround process are considered.

Turnaround companies close to or even in financial distress exhibit a low market valuation as investors discount the risk of default. As such, investing in them can be regarded as an aggressive value investing strategy. Excluding turnaround companies exhibiting losses introduced an unavoidable survivorship bias, but since an ex-post analysis of the realized performance of successful turnaround companies is conducted (versus trying to forecast the potential performance of a selected portfolio), this does not compromise the findings (Elaut & Erdős, 2019).

For the overall analysis, companies lacking financial data in Refinitiv were excluded from the sample. Table 6 displays the sample's entire country breakdown as per the investment approach.

In **Step Two**, P/E and P/B ratios are applied to assess the relative value of the identified stocks of Step One. A significant advantage of the novel two-step approach is that it considers various

Table 6. Country breakdown of portfolio constituents for each investment approach

Countries	Value stocks	Spin-offs	Turnaround companies
United States of America	91	74	28
United Kingdom	6	12	6
Japan	70	1	10
China	7	3	15
Hong Kong	9	2	6
France	6	4	1
Canada	4	1	5
Switzerland	4	2	3
Australia	11	3	5
Taiwan	22	1	2
Rest of the world	50	28	37
Total	280	131	118

Note: Rest of the world includes, amongst others, Mexico, Finland, Brazil, Vietnam, Malaysia, and Greece.

screening aspects in the identification process while employing traditional value ratios, P/E and P/B, as a reliable ranking measure for relative value in the final assessment of the potential portfolio constituents. Step Two of the novel two-step approach is applied to all three approaches: value stocks, spin-offs, and turnaround companies. Since the ranking is conducted with different frequencies, one year, three years, and five years, the rank order (and thus the portfolio composition for calculating the performance metrics) will be quite different for each buy-and-hold strategy over time. Thus, comparing the 1-year, 3-year, and 5-year buy-and-hold strategy results will yield insights into how the three different investment approaches compare over time.

To investigate whether stocks with lower P/E or P/B ratios of each investment approach, value stocks, spin-offs, and turnaround stocks provide a superior return compared to stocks with higher values for the ratios of the same approach, eight portfolios per approach are constructed, labeled A–H. Portfolios A–D distinguish themselves with the P/E ratio and portfolios E–H with the P/B ratio. Each portfolio A-D and E-H consists of 25 percent of the total constituents as per the investment approach, and each stock from the data sample has been equally weighted within a portfolio and for each investment approach to avoid any over-representation of large-cap stocks.

Table 7 shows the categorized portfolios A–D based on the P/E ratios. The 25/75 percent-quartile and median P/E ratios were used to group the portfolios. For each portfolio from A–D, Portfolio A included the stocks with the lowest 25 percent P/E ratios of each approach, and Portfolio D included the stocks with the highest 25 percent P/E ratios.

Table 7. Categorization of portfolios according to their P/E ratio

Portfolios	A	B	C	D
P/E	low ←			→ high
Value stocks				
Range	<11.16	11.17 – 15.44	15.45 – 22.06	>22.07
Median	9.18	13.02	17.93	27.93
Standard deviation	1.99	1.30	1.78	32.72
Spin-offs				
Range	<12.05	12.05 – 17.39	17.40 – 23.49	>23.49
Median	7.85	14.89	20.43	33.71
Standard deviation	2.90	1.71	1.54	109.45
Turnaround companies				
Range	<8.13	8.13 – 14.41	14.42 – 22.03	>22.03
Median	6.56	11.31	17.21	37.16
Standard deviation	2.49	1.90	2.12	40.98

Each approach exhibited several strong outliers with P/E ratios above one hundred. The standard deviation for Portfolio D was higher than for Portfolios A–C.

Table 8 shows Portfolios E–H, constructed with the same procedure and data sample as Portfolios A–D, but employing the P/B ratio for segmentation. While Portfolio E included the stocks with the lowest 25 percent of P/B ratios of each investment approach, Portfolio H contained the stocks with

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Table 8. Categorization of portfolios according to their P/B ratio

Portfolios	E	F	G	H
P/B	low ←			→ high
Value stocks				
Range	<1.50	1.50 – 2.18	2.19 – 2.97	>2.97
Median	1.20	1.77	2.41	4.10
Standard deviation	0.30	0.19	0.20	2.91
Spin-offs				
Range	<0.82	0.82 – 1.39	1.40 – 2.97	>2.97
Median	0.59	1.08	2.16	4.43
Standard deviation	0.18	0.17	0.42	3.31
Turnaround companies				
Range	<0.70	0.70 – 1.14	1.15 – 1.96	>1.96
Median	0.55	0.87	1.45	3.03
Standard deviation	0.12	0.13	0.25	2.50

the highest 25 percent of P/B ratios. Turnaround stocks had, in general, the lowest P/B ratios. The three investment approaches had outliers with P/B ratios above five, significantly increasing the standard deviation of portfolio H for each approach.

3. RESULTS

Each investment approach contained the largest number of stocks from the United States, comprising 32.5 percent of all value stocks, 56.5 percent of all spin-offs, and 23.7 percent of all turnaround companies as the largest stock exchanges are operated in the United States (e.g., NYSE and NASDAQ) (Statista, 2022), and as the United States possess both high accounting standards and disclosure requirements. Accordingly, fewer U.S. stocks had to be removed from the data sample than stocks from other countries when accounting for full data coverage. The concentration of U.S. constituents in the portfolios of the different investment approaches is commensurate with the overweighting of U.S. stocks representative global equity benchmark indices and thus does not introduce a too strong bias in the sample data but rather extends the coverage of the study beyond the U.S. to other regions and countries.

Table 9 shows the average and median returns of the S&P 500 index over the three investment horizons. The benchmark delivered an average return of 5.6 percent over one year, 17.6 percent over three years, and 33.6 percent over five years, where two periods with a significantly lower performance impacted the average return: Between 2000 and 2002, the S&P 500 index delivered a cumulative return of –40.1 percent and, owing to the financial crisis in 2007/08, the S&P 500 index yielded a return of –38.5 percent in 2008. Thus, the average annual return of the S&P 500 index between 2000 and 2008 significantly differed from the 2009–2019 period.

Table 9. Market return of the S&P 500 index over the three analyzed investment horizons between 2000 and 2019

S&P 500 Return	1 Year	3 Years	5 Years
Average Return	5.60%	17.55%	33.56%
Median Return	9.27%	25.10%	29.57

While the average annual return between 2009 and 2019 was 12.9 percent, the S&P 500 index only delivered an average annual return of –3.3 percent between 2000 and 2008. The average return of the S&P 500 index over one and three years was lower than the average median return.

3.1. Results and Return Statistics of Step One

Table 10 shows the stocks' HPRs for the analyzed time horizons for all three investment approaches as constructed with Step One. The stocks of all three approaches, on average, outperformed the S&P 500 index on a three- and five-year horizon with a significance level of one percent.

Over one year, the average return of value stocks was 12.9 percent, and 45.7 and 95.6 percent on three-year and five-year holding periods, respec-

Table 10. Return statistics for the stocks of the three different investment approaches of Step One

	Value stocks	Spin-offs	Turnaround companies
I. 1-year return			
Average	12.9%	13.9%	68.5%
	(0.05911)*	(0.06577)*	(2.808E–06)***
Median	10.6%	7.5%	43.3%
Standard deviation	0.38	0.42	1.37
1. Quartile (25%)	–13.2%	–12.5%	11.0%
3. Quartile (75%)	31.9%	40.1%	90.6%
II. 3-year return			
Average	45.7%	45.6%	124.9%
	(0.00198)***	(0.00405)***	(8.057E–10)***
Median	43.2%	32.7%	86.3%
Standard deviation	1.00	0.83	1.62
1. Quartile (25%)	–1.1%	–11.9%	22.0%
3. Quartile (75%)	77.8%	94.3%	165.0%
III. 5-year return			
Average	95.6%	95.0%	154.0%
	(0.00058)***	(0.00049)***	(2.329E–07)***
Median	51.2%	63.4%	84.9%
Standard deviation	2.29	1.39	2.05
1. Quartile (25%)	–12.3%	0.0%	32.6%
3. Quartile (75%)	144.1%	94.3%	179.2%

Note: This table shows the HPRs obtained for the three investment strategies over the three investment horizons and their respective p-values. The 1. Quartile (25%) and 3. Quartile (75%) stand for the bottom and top 25% of the data in terms of returns. The standard deviation shows the variability of the return distribution. * Significance level at 10%, ** significance level at 5%, and *** significance level at 1%.

tively. Comparing the average returns to the median returns, the returns showed a right-skewed distribution. 25 percent of the value stocks delivered a return of –12.3 percent or below over five years on average, and 25 percent delivered a return of 144.1 percent or above. The wide distribution of the returns of value stocks over five years led to a significant standard deviation of 229 percent.

Out of the 20-year sample period, five years experienced a negative one-year return. On a three-year basis, value stocks showed, on average, a negative return from 2000 to 2002 and from 2005 to 2007. Only the value stocks of 2003 realized a negative return over five years, possibly because the investment period ended during the 2008 financial crisis. The strongest three-year and five-year return performance was in 2002 and 2006. These return statistics were impaired as only seven companies in 2002, and one in 2006 were identified as value stocks through the applied screening. As a result, the value stocks of 2002 realized an average five-year HPR of 449 percent. Besides those outliers, the value stocks from the years 2014 to 2016 showed the best five-year performance with an average of over 100 percent. Besides value stocks, over 50 percent of the turnaround stocks had a P/E ratio below 15.

Spin-offs achieved an average return of 13.9 percent over a one-year holding period, 45.6 percent over three years, and 95.0 percent over five years. 75 percent of all spin-offs delivered a positive return over five years. Like value stocks, the annual returns of spin-offs did not show a clear return pattern. Spin-offs realized a negative one-year return in five years (2001, 2002, 2007, 2014, and 2017), almost congruent with negative returns from the value stocks. The five-year return statistic for 2002 was impaired as only one spin-off was identified. The spin-off transaction from 2002 realized a five-year HPR of 646.8 percent. The highest five-year HPR, besides the outlier, was in 2008, which applies to the investment period from 2008–2012.

Successful turnaround companies experienced the highest returns over three investment periods compared to value stocks and spin-offs. Over one year, the average return of turnaround companies was 68.5, 124.9 over three, and 154.0 percent over

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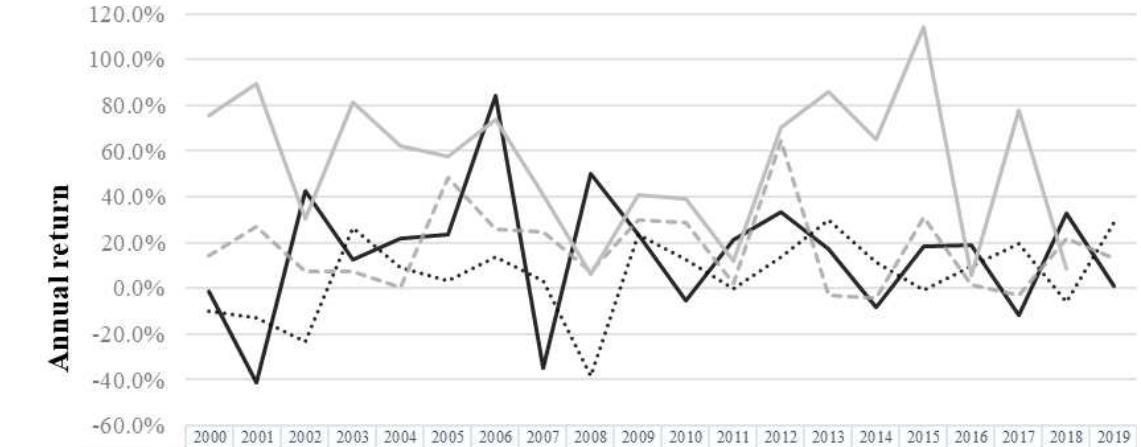
five years. 75 percent of turnaround stocks exhibited a return of 179.2 percent on average over five years. Turnaround companies achieved the highest average returns of the three investment approaches. The five-year return was above 100 percent over 12 years. This overly significant outperformance can be explained by the survivorship/look-ahead bias that has been introduced via the selection mechanism for successful turnaround companies only (see section Methodology). Since the time of investment in turnaround companies was at the beginning of the third year of the z-score pattern, and only successful turnaround companies between 2000 and 2019 were included, there was no one-year return in 2019.

Figure 1 shows the development of the average one-year returns of the S&P 500 index and the three investment approaches. As indicated in Figure 3, the difference between the highest one-year return of 114.2 percent, obtained in 2015, and the lowest return of 5.6 percent in 2016, was 108.6 percent.

Turnaround stocks constituted the only investment approach that never experienced a loss on average over one year, but the annual return performance of turnaround stocks showed substantial volatility over time. The maximum one-year return by spin-off stocks was in 2012 at 64.5 percent. Value stocks experienced the lowest returns on average in 2001 at 41.4 percent and in 2007 at 34.7 percent. The highest one-year return of value stocks was 84.4 percent in 2006. Turnaround companies, spin-offs, and value stocks showed an annual return pattern over 20 years with no statistically significant correlation to the S&P 500 index returns, thus offering a diversification benefit.

Table 11 shows the risk-adjusted excess returns for each investment approach. All three approaches deliver a positive risk-adjusted excess return over the three investment periods. As seen in the t-test results, almost all return figures show results with the highest statistical significance. On average, value stocks and spin-offs experienced a similar alpha over the three investment horizons. Still, value stocks delivered a higher Treynor ratio than spin-offs over three and five years. Hence, investors in value stocks received a higher excess return for each unit of risk. The average betas of the three investment approaches confirm, in parts, the theory that an increasing number of equities in a portfolio increases diversification by averaging out the contribution of idiosyncratic risks and leaving the general market risk, the systematic risk, as a substantial source of the portfolio's risk, consistent with a beta-coefficient closer to one.

With a varying sample size for the three different approaches, the diversification effect, too, differs in strength. Successful turnaround companies had, on average, the lowest beta and the highest returns. Hence, turnaround companies realized the highest excess returns with an average alpha of 62.8 over one year, 107 over three years,



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
S&P 500	-10.1%	-13.0%	-23.4%	26.4%	9.0%	3.0%	13.6%	3.5%	-38.5%	23.5%	12.8%	0.0%	13.4%	29.6%	11.4%	-0.7%	9.5%	19.4%	-6.2%	28.9%
Value Stocks	-1.1%	-41.4%	42.7%	12.4%	21.9%	23.2%	84.4%	-34.7%	50.1%	23.5%	-5.3%	21.1%	33.1%	17.0%	-8.0%	18.6%	19.1%	-11.6%	32.7%	0.8%
Spin-offs	14.0%	26.9%	7.2%	7.2%	0.5%	48.6%	25.6%	24.7%	7.2%	29.8%	28.5%	2.0%	64.5%	-2.9%	-4.0%	31.2%	1.5%	-3.3%	21.7%	13.2%
Turnarounds	75.5%	89.5%	30.4%	81.3%	62.3%	57.8%	73.8%	40.7%	5.9%	40.7%	39.0%	12.2%	70.4%	86.1%	65.0%	114.2%	5.6%	77.8%	8.5%	

Figure 1. Average one-year returns over time

Table 11. Risk-adjusted return statistics of the three different investment approaches of Step One

Measure	Value stocks	Spin-offs	Turnaround companies
I. 1-year return/risk			
Beta, 3 years weekly (β_p)	1.09	1.18	1.06
Expected average return	5.8%	5.9%	5.7%
Excess average return (Jensen's alpha)	7.1%	8.0%	62.8%
	(0.0017)***	(0.01792)**	(1.123E-06)***
Treynor ratio	0.083	0.085	0.611
II. 3-year return/risk			
Beta, 3 years weekly (β_p)	1.09	1.18	1.06
Expected average return	18.1%	18.5%	17.9%
Excess average return (Jensen's alpha)	27.6%	27.1%	107.0%
	(1.361E-05)***	(0.00020)***	(2.835E-11)***
Treynor ratio	0.309	0.286	1.067
III. 5-year return/risk			
Beta, 3 years weekly (β_p)	1.09	1.18	1.06
Expected average return	34.7%	35.8%	34.3%
Excess average return (Jensen's alpha)	60.9%	59.1%	119.7%
	(1.160E-05)***	(3.207E-06)***	(2.822E-09)***
Treynor ratio	0.686	0.631	1.260

Note: This table shows the return-risk relationship for each investment strategy for the three investment periods and the respective p-value of Jensen's alpha. The return was benchmarked against the S&P 500 index. The average annual 30-year U.S. Treasury bond rate between 2000 and 2019 of 3.84% was used as the risk-free rate for the CAPM. * Significance level at 10%, ** significance level at 5%, and *** significance level at 1%.

and 119.7 percent over five years. Since successful turnaround companies provided the highest returns and lowest betas, those stocks also achieved the highest Treynor ratio in all investment periods. Turnaround stocks outlined a Treynor ratio of 1.067 over three and 1.260 over five years, concluding that investors earned 106.7 and 126.0 percent per unit of systematic risk (beta) taken by investing in a turnaround portfolio.

3.2. Results and Return Statistics of Step Two

Building on the three pre-screened investment portfolios (as per Step One), the results of Step Two are examined: The risk-adjusted returns from portfolios A to D are shown in Table 12. Value stocks with a low P/E realized the highest average returns over one year, with an alpha of 12.0 percent. At the same time, value stocks with the highest P/E ratios in Portfolio D performed the best on average over three and five years.

Even though turnaround companies with lower P/E ratios in portfolios A and B had a higher beta coefficient than Portfolio C, a higher excess return was obtained. Successful turnaround companies in Portfolio A resulted in a significant average positive alpha of 185.9 percent over three and 195.5 percent over five years. Congruent with the average returns, the P/E ratio had a minor impact on spin-offs' risk-adjusted excess returns.

Table 13 shows the risk-adjusted returns from portfolios E–H based on the P/B ratios. Value stocks with the lowest P/B ratios in Portfolio E provided a higher average excess return of 14.4 percent over one year, 43.8 percent in three years, and 115.7 percent in five years compared to value stocks with a higher P/B ratio. However, the one-year outperformance of values stocks in portfolio E was not statistically significant. Successful turnaround companies with the lowest P/B ratio realized the highest average excess returns. Even though turnaround companies in Portfolio H had a lower beta coefficient on average, a lower average excess return was delivered on all three investment horizons. The results of the t-tests confirm the significance of the outperformance of turnaround companies with a low P/B ratio on a three- and five-year basis. As for the Portfolios A-D, the P/B did not impact the excess return of spin-offs.

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Table 12. Risk-adjusted return statistics of the three different investment approaches of Step Two (P/E ratio criteria)

Portfolio	Value stocks	Spin-offs	Turnaround companies
	A.		
Beta, 3 years weekly (β_p)	1.10	1.27	1.09
Excess average return (Jensen's alpha) 1 year	12.0%	5.7%	78.4%
Excess average return (Jensen's alpha) 3 years	26.5%	52.5%	185.9%
Excess average return (Jensen's alpha) 5 years	58.5%	52.0%	195.5%
	B.		
Beta, 3 years weekly (β_p)	1.05	1.05	1.04
Excess average return (Jensen's alpha) 1 year	9.9%	12.2%	72.6%
Excess average return (Jensen's alpha) 3 years	21.7%	20.6%	138.4%
Excess average return (Jensen's alpha) 5 years	44.8%	72.9%	196.1%
	C.		
Beta, 3 years weekly (β_p)	1.16	1.21	0.94
Excess average return (Jensen's alpha) 1 year	3.0%	3.5%	20.5%
Excess average return (Jensen's alpha) 3 years	28.2%	1.4%	37.8%
Excess average return (Jensen's alpha) 5 years	58.6%	46.4%	35.2%
	D.		
Beta, 3 years weekly (β_p)	1.05	1.16	1.16
Excess average return (Jensen's alpha) 1 year	4.6%	12.3%	78.6%
Excess average return (Jensen's alpha) 3 years	34.0%	31.0%	64.9%
Excess average return (Jensen's alpha) 5 years	82.3%	66.9%	53.9%
Spread average return between A and D (1 year)	0.07453	–0.06358	–0.00314
	(0.14317)	(0.29124)	(0.49732)
Spread average return between A and D (3 years)	–0.07158	0.22211	1.20634
	(0.37200)	(0.20382)	(0.00342) ***
Spread average return between A and D (5 years)	–0.23199	–0.13538	1.40710
	(0.33604)	(0.37576)	(0.00709) ***

Note: This table shows the excess return for the investment portfolios A-D, selected according to the P/E ratios. Portfolio A contains the stocks with the lowest 25% of P/E ratios out of the sample and D the highest 25%. As with Table 15, the returns were benchmarked against the S&P 500 index, and the average annual 30-year U.S. Treasury bond rate between 2000 and 2019 of 3.84% was used as the risk-free rate. * Significance level at 10%, ** significance level at 5%, and *** significance level at 1%.

Table 13. Risk-adjusted return statistics of the three different investment approaches of Step Two (P/B ratio criteria)

Portfolio	Value stocks	Spin-offs	Turnaround companies
	E.		
Beta, 3 years weekly (β_p)	1.10	1.33	1.06
Excess average return (Jensen's alpha) 1 year	14.4%	9.9%	95.0%
Excess average return (Jensen's alpha) 3 years	43.8%	46.3%	189.2%
Excess average return (Jensen's alpha) 5 years	115.7%	64.6%	176.9%
	F.		
Beta, 3 years weekly (β_p)	1.00	1.35	1.13
Excess average return (Jensen's alpha) 1 year	4.5%	6.9%	46.0%
Excess average return (Jensen's alpha) 3 years	35.7%	19.0%	78.6%
Excess average return (Jensen's alpha) 5 years	45.7%	54.2%	57.0%
	G.		
Beta, 3 years weekly (β_p)	1.13	1.05	1.07
Excess average return (Jensen's alpha) 1 year	3.7%	5.4%	78.3%
Excess average return (Jensen's alpha) 3 years	16.3%	16.3%	99.8%
Excess average return (Jensen's alpha) 5 years	70.9%	42.5%	109.5%

Table 13 (cont.). Risk-adjusted return statistics of the three different investment approaches of Step Two (P/B ratio criteria)

Portfolio	Value stocks	Spin-offs	Turnaround companies
	H.		
Beta, 3 years weekly (β_p)	1.14	1.00	0.97
Excess average return (Jensen's alpha) 1 year	5.9%	17.5%	33.3%
Excess average return (Jensen's alpha) 3 years	12.6%	46.7%	60.2%
Excess average return (Jensen's alpha) 5 years	51.6%	109.7%	53.8%
Spread average return between E and H (1 year)	0.08410 (0.114256)	–0.07009 (0.23707)	0.62290 (0.00132) ***
Spread average return between E and H (3 years)	0.31048 (0.04033) **	0.01335 (0.47689)	1.31177 (0.00348) ***
Spread average return between E and H (5 years)	0.95372 (0.04306) **	–0.40932 (0.14333)	1.50496 (0.00696) ***

Note: Portfolio E contains the stocks with the lowest 25% P/B ratios out of the sample and H the highest 25%. Like with Table 14, the returns were benchmarked against the S&P 500 index and the average annual 30-year U.S. Treasury bond rate between 2000 and 2019 of 3.84% was used as the risk-free rate. * Significance level at 10%, ** significance level at 5%, and *** significance level at 1%.

4. DISCUSSION

The results indicate that the portfolios analyzed applying the novel two-step approach to assess Enhanced Value to the three investment approaches consistently outperformed the S&P 500 benchmark index over one, three, and five years and delivered a significant risk-adjusted excess return in all cases. While the main value creation with respect to generated excess returns originates in Step One of the two-step approach, Step Two has, by careful differentiation of the stocks regarding their P/E and their P/B ratios, provided detailed insights into the return characteristics of value stocks, spin-offs, and turnaround companies. Thus, the null hypothesis H_0 (6a) is rejected. The existence of a positive alpha this study has found aligns with Pedersen (2015), stating that markets are not always fully efficient.

4.1. Value Stocks

The results of the study confirm the findings from earlier studies by Lakonishok (1994), Bauman (1998), Cheng and Wang (2014), and An et al. (2017) that value stocks deliver an excess return on average over one year. Furthermore, value stocks provide a strong risk-adjusted excess return on average over three and five years. This finding was, in parts, unexpected and suggests that stocks with high-value patterns regarding liquidity, earnings, and leverage deliver a significant excess return also in the mid-term. Thus, investors in value stocks will be rewarded with a consistent alpha over time for taking the default-like risk associated with value stock investments.

Step Two of the assessment process demonstrates that value stocks associated with a low P/E and low P/B ratio realize a significant excess return over one year, in line with Basu (1977) and Fama and French (1992). However, by enhancing the investment horizon up to three and five years, value stocks with a low P/E ratio do not consistently outperform stocks with a high P/E ratio, while this is still the case for the portfolios constructed via the P/B ratio. This contradicts earlier findings by Basu (1977) and might be explained by the fact that earnings are not such a consistent mid-term indicator of the company's intrinsic value compared to the book value.

4.2. Spin-offs

Contrary to Basu (1977) and Fama and French (1992), arguing that stocks with a lower P/E or P/B will realize a higher return, the results from portfolios A–H showed that spin-off stocks with a lower P/E or P/B ratio do not outperform spin-off stocks with a respective higher ratio.

An explanation could be that lower P/E or lower P/B spin-offs might not outperform those with higher ratios since spin-offs result from corporate transactions, whereas straightforward value stocks and turnaround companies are assessed by

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financial metrics quantifying their intrinsic value. Thus, less attention might be given to the two multiples for spin-offs, especially on the IPO day, while it can be assumed that other characteristics of the spin-off transaction play a more prominent role in determining the response of their stock price to the spin-off event.

The absence of significance of the valuation metric P/B on the returns of spin-offs found in this study's data sample contradicts, in parts, the more general findings of Bülow and Mjörnemark (2019), who argue that spin-offs with a lower valuation (captured by EV/EBIT or P/B) provide a superior return than spin-offs with a higher valuation.

Finally, a (larger) part of the excess performance found in this study for spin-off might be related to insider knowledge and trading, a factor which is notoriously difficult to quantitatively account for (Allen (2001)), or other factors (McConnell et al. (2015)).

4.3. Turnaround companies

For successful turnaround stocks, the excess return is confirmed over one, three, and five years, as found in an earlier study (Danielson & Dowdell 2001). It thus supports Stanley et al. (2001), who found market inefficiencies for turnaround growth portfolios. However, the extent of the excess return is more consistent with Eberhardt et al. (1999), who demonstrated that their average cumulative average returns (ACARs) varied between 24.6 and 138.8 percent within the first year. This may arise due to heterogeneous turnaround companies and different identification methods, thus resulting in different selections of turnaround stocks for investment portfolios.

In contrast to Jory and Madura (2010), where the post-bankruptcy stock performance has been similar to that of their size and book-to-market matching firms, a substantially higher average excess return of successful turnaround companies has been revealed in this investigation. The up-to-three-year excess return for turnaround stocks can be understood by postulating that a company's turnaround process is completed after three years (latest) after the timing of initial investment, providing evidence of a reduced excess return growth afterwards. This would be coherent with the successful turnaround company being in a recovery process lengthier than just one year.

Moreover, this paper shows that successful turnaround stocks with a lower P/B ratio deliver a significantly higher return over three and five years than turnaround companies with a higher P/B ratio. This confirms the findings of Aharoni et al. (2013), arguing that turnaround stocks have a negative relationship with stock returns and the P/B ratio (positive with B/M ratio). Since successful turnaround stocks and value stocks share the characteristic of being undervalued and the value factor negatively correlates with the momentum factor, this observation is consistent with the general factor theory.

The same holds true for successful turnaround companies with a lower P/E ratio, confirming Basu's (1977) and Fama and French's (1992) findings that stocks with lower P/E or P/B ratios deliver a superior return.

CONCLUSION

With the novel two-step approach to assessing Enhanced Value in single stocks, it has been analyzed if the three investment approaches, value stocks, spin-offs, and successful turnaround companies, outperform the S&P 500 index consistently. In Step Two, the effects of the P/E and P/B ratios on the returns of each investment approach and the returns of the resulting eight portfolios per approach have been investigated. It has been found that value stocks, spin-offs, and successful turnaround companies outperform the S&P 500 index on average over a one-year, three-year, and five-year investment horizon with a simple passive buy-and-hold strategy. Thus, the alternative hypothesis H_1 (6b) has been proven, confirming earlier studies that these investment approaches possess the inherent potential to generate risk-adjusted excess returns and provide deeper insight into the mid-term performance of value stocks, spin-offs, and successful turnaround companies. Second, by utilizing the P/E and P/B ratios, investors

can achieve a superior investment performance in value stocks and turnaround companies if they can predict successful value stocks or turnaround companies with any statistical significance.

One of the most significant findings is that the P/E and P/B ratios strongly impact the return of successful turnaround companies and value stocks while, interestingly, not affecting the performance of spin-offs. As detailed in the Discussion section, an explanation for this phenomenon might be that other characteristics of the spin-off transaction, like insider trading, play a more prominent role in determining the response of their stock price to the spin-off event than plain value.

The investigation faces certain limitations: The joint hypothesis problem introduced by Fama (1991) remains and poses a major limitation of this study. It remains principally unclear if the abnormal returns result solely from the value factor, an inefficient market, or from a flawed asset pricing model. As mentioned, a (large) part of the outperformance will be attributed to the look-ahead biases and/or any insider trading. At least the contribution of the plain value approach to the excess return might be deduced by comparing it to the spin-off and the turnaround approach, thus identifying differences in the efficacy and the effective period of the three different approaches.

This study applied CAPM to assess the systematic risk of a security or portfolio. However, additional risk factors beyond the market factor are not captured in CAPM, which could be responsible for the solid abnormal returns. Attributing the returns to further well-established factors, like momentum, size, or other definitions of the value factor, will yield additional insights and help to isolate the merits of the two-step approach and Enhanced Value.

Furthermore, limitations apply to the turnaround stocks, as the study shows the hypothetical possible return private investors may achieve after year two of the turnaround point when the z-score increased further in years three and four, indicating a successful turnaround. Nonetheless, over the first two years, investors do not know whether the Altman z-score would increase after the timing of the investment. Thus, the stock selection exhibits a strong survivorship bias. Such a bias is, of course, of utmost importance when selecting/investing in turnaround stocks. However, as in this event study, only the excess return characteristic has been examined statistically rather than providing any forecast-like investment advice, so the results of this study are not compromised.

Additional limitations resulted from data-coverage issues, as discussed in the Methodology section, as companies, such as banks, had to be excluded owing to their high leverage ratio. Secondly, the Earnings Quality Model lacks companies from 2000–2005 with a score above 80. Thirdly, Refinitiv only provides a rank value that includes net debt for spin-off transactions amounting to more than USD 1.5 billion, resulting in a large-cap bias for spin-offs in the sample. Furthermore, only spun-off companies with positive net earnings during the first year after the IPO were examined, while companies with negative financial results were excluded. The same holds true for companies that were delisted in years following the spin-off transaction, as financial data for these companies was unavailable.

Thus, a more comprehensive data set will surely help to contribute to a more in-depth research approach.

Finally, combining a sufficiently accurate prediction model for successful turnarounds and/or spin-offs with an early indicator for assessing value, like, e.g., the ratio price-to-estimated earnings, could yield insights that investors might realistically apply to selecting stocks and creating investment portfolios without the discussed look-ahead biases.

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