VERDAD

CRISIS INVESTING:

HOW TO MAXIMIZE RETURN DURING MARKET PANICS

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"The time to buy is when there's blood in the streets.“

-Baron Rothschild

“The spoils of war come only in wartime.”

-Oliver Joost

INTRODUCTION

We are 10 years into one of the longest bull markets in history. But what if the market turns? What if greed turns to fear, optimism to pessimism?

This concern – amplified by the salient pain of the 2008 global financial crisis – has led many investors to set aside portions of their portfolios in cash, bonds, and gold. They imagine that in another March 2009 (or February 2016 or December 2018), they'll have the fortitude to buy the dip, deploying their sleep-at-night money into risk assets at the bottom.

But if history is any indicator, those skittish during the great bull market will be panic-stricken when volatility hits. Fund flows into risk assets are, after all, pro-cyclical, rising in good times, falling in bad times. In the fog of war, most people's decision-making abilities are impaired, not heightened.

What investors need then is a clear understanding of what worked and didn't work in prior crises.

We have spent the past year studying every financial crisis in the US since 1970. We have done this work for your benefit, so that you will keep your head when all about you are losing theirs. When weak hands fold, when forced sellers liquidate, we hope this research will help you make good decisions.

To develop this in-depth analysis of market panics, we looked at every major asset class, every sector, and every quantitative factor. We looked at index-level data, and then we built a database of security-level data. We read through the newspapers during each panic to understand what investors most feared. And we distilled the lessons from this massive study into the report you are reading now.

A variation of an ancient Roman proverb says: "fortuna eruditis favet." Fortune favors the prepared mind.

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PREDICTABILITY IN TIMES OF CRISIS

Tolstoy wrote in Anna Karenina, “happy families are all alike; every unhappy family is unhappy in its own way.”

Markets are the opposite. Bull markets are all bullish in their own ways. The leaders in one expansion are almost never the leaders in the next. In the 2000s, companies with exposure to emerging markets and commodities were the biggest winners. In the 2010s, the FANG stocks and other technology companies drove the market expansion. It’s hard to predict what investors will fall in love with in a bull market.

But crises are alike. A recent academic study found that standard models for predicting returns in equity markets are 8x as predictive during recessions as during expansions. Take, for example, the classic factors that Nobel Prize winner Eugene Fama and his research partner Ken French developed: size, value, and investment. The smallest decile of stocks (SMB), the cheapest decile of stocks (HML), and the most conservative capital deployment decile of stocks (CMA) perform much better during crises and with much higher consistency than at other times. Figure 1 shows the average 2-year forward return starting in times of crisis (as defined by the high-yield spread rising above 6.5%) and Figure 2 shows the percentage of months during which the factor portfolio outperformed the broader stock market.

Figure 1:
Avg 2-yr Return by Factor

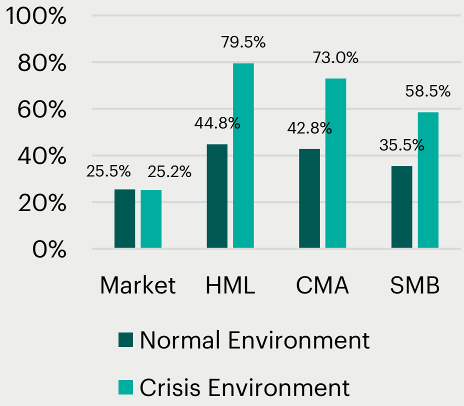
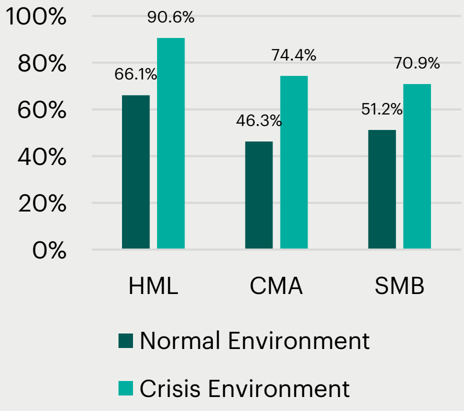


Figure 2:
Months Factor Portfolio > Market



Note: Returns are for an equal-weighted top decile portfolio of each factor.
Source: Ken French Data Library

Crisis periods account for most of the excess returns attributable to each factor over the entire duration of our observed period, from 1953-2019.

The higher returns to quantitative investing accrue from the abnormally bad behavior of humans. During bad economic times, investors and lenders panic. Consider these quotes drawn from newspapers during previous crises:

"The main excesses of the past few years have scarcely begun to be liquidated." – David L. Babson, Investment Advisor (1969)
"We're talking about a possible economic wipeout." – Tim Richardson, Editor (1986)
"They're selling the good with the bad because they can. They're throwing everything out the window." – Brian Finnerty, C.E. Unterberg Towbin (2000)

This market sentiment has real-world impact. When investors and lenders panic, they reduce new lending and new investment as they attempt to de-risk their balance sheets. In a famous paper, Ben Bernanke labeled this the "financial accelerator": economic shocks cause investors and lenders to panic and stop new lending and investing. Firms that rely on external financing reduce their discretionary spending, and weaker firms go bankrupt, all of which reflexively feeds back into aggregate economic activity. We can see this pattern recurring in the historical data. Below, we show default rates and borrowing costs for high-yield issuers compared to a GDP-based recession indicator.

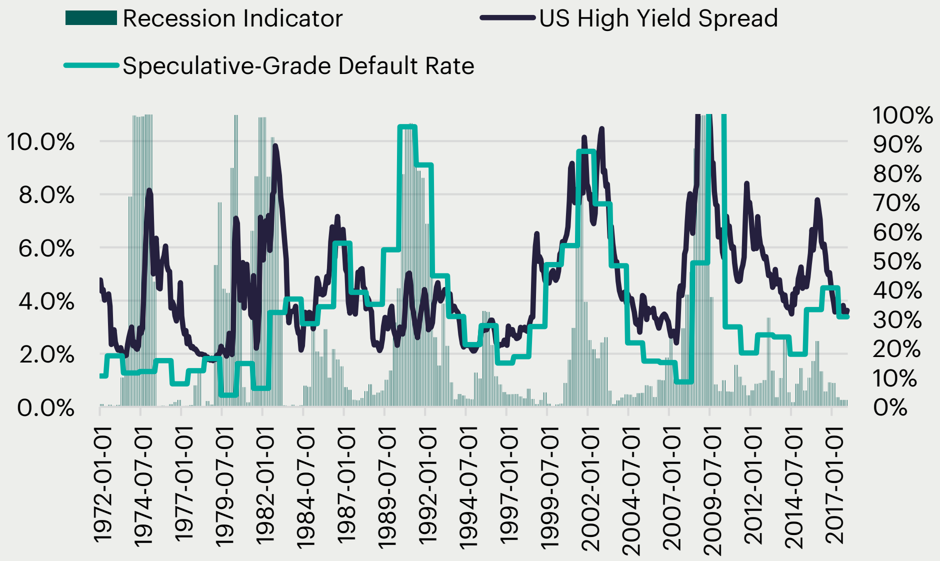


Figure 3:

Recessions, Borrowing Costs, and Default Rates

Source: FRED

During recessions, the high-yield spread spikes upward and default rates soar. This stress rewards companies that are profitable and cash generative, while weak firms and companies that are investing heavily and burning cash struggle and often go bankrupt. We can see this in Figure 4 by comparing the performance of profitable and cash-generative firms to their unprofitable and cash-burning peers.

Simple, logical quantitative factors are significantly more predictive during these times of economic crisis than they are during expansions. Crises are high-stress environments where basic tests of solvency and profitability become seminally important in dictating a company's survival and economic future. Companies like Tesla and WeWork may thrive during expansions when money is cheap, but such excesses do not long survive in times of market turmoil.

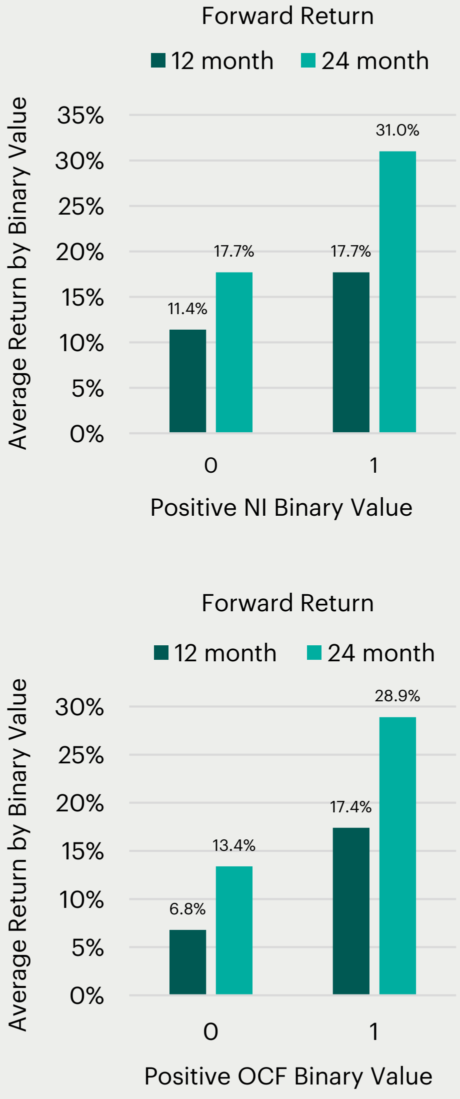
Investors who can keep their heads when everyone about them is losing theirs can therefore exploit simple predictable rules to make significantly outsized returns – and have the confidence that the probability of achieving these higher returns is much higher in times of crises than otherwise.

The only problem is the extreme behavioral difficulty of investing when others are panicking. For each crisis, we read through the newspapers at the time of the crisis and include key quotes from that research in this essay to help provide insight into just how stressed investors were – and the levels of fear one would need to overcome to profit.

In this paper we will lay out the information you need to make decisions when crisis strikes.

Figure 4:

Returns for Profitable vs. Unprofitable Firms and Positive Cash Flow Firms vs. Negative Cash Flow Firms



Source: CRSP Compustat

METHODOLOGY

We use the high-yield spread as our prime measure of economic distress. This economic indicator measures the spread between the borrowing rate for below-investment-grade bonds and the corresponding safe interest rate. The high-yield spread is a gauge for monitoring market sentiment for small and micro-cap companies because it combines real world economic consequences and the temperature of the market. When the high-yield spread rises, it reflects higher borrowing costs for smaller, less-creditworthy business. This is a real economic cost which impacts decisions. Additionally, the spread measures the market's confidence in the performance of these same businesses and the associated cost required in compensation for the risk of investing.

Prior to 2010, every major economic recession overlapped with a high-yield spread or "financial accelerator" event. Since 2010, these financial accelerator events have overlapped with economic activity that fell slightly short of a recession, but nevertheless reflected high degrees of uncertainty and fear in the markets.

We looked specifically at eight economic crises, when spreads rose above 6.5% to highly elevated levels, in 1974, 1980, 1986, 2000, 2008, 2010, 2012, and 2016 and looked at what financial assets performed the best in each of the crises. We looked at every major asset class and then did a deep dive on stocks and bonds.

It is worth calling out 1990 specifically since this was a small recession which came close to meeting our definition of a crisis but did not. Caused by an overhang of federal deficit from favorable tax and underinvestment, it was further compounded by restrictive monetary policy which was aimed at curbing inflation. A sudden increase in the price of oil shocked consumer confidence and resulted in a short period of recessionary activity before the economy got back on track. Even though we do not include this as a crisis, the same trends we observed in the other recessions held true here. In the 12 months from the bottom, small value stocks returned 24% (and the multi-factor equity model we discuss below returned 74%).

In the course of examining the high-yield data, we realized that the most reliable source, the BAML US High Yield Master II, only went back to 1996. To address this deficiency, we overlaid Baa Corporate Bond Yield Spread, which extended back to 1953, with the high-yield spread. For the overlapping period of 1996-2019, the two time series had a correlation of 0.94. Given the high degree of correlation, we built a composite high-yield spread index back to 1953 using the Baa spread.

We constructed the eight high-yield events in such a way that would be consistent with how investors would experience them in real-time. We defined these “financial accelerator” events as the first month in which high-yield spreads break above 6.5% and where the preceding 24 months were below 6.5%. We used 6.5% as the high-yield spread threshold because it is roughly 1 standard deviation above the long-term average (~4%). The model is not particularly sensitive to this assumption, and we could have used 6% or 6.25% and had similar results.

For calculating returns during these events, we start investing 3 months after spreads hit 6.5%. Usually, high-yield spreads continue to rise after they hit 6.5%, peaking a few months later. This is also when the impacted equities stock prices are most precipitously affected, representing the optimal time to buy.

To understand what worked by asset class, we built a dataset of stock market returns by factor, bond returns by rating and issuer type (i.e., corporate vs. government), alternative asset returns for private equity and distressed debt, and REIT returns.

To understand what worked in stocks, we built a dataset from the combined CRSP/Compustat securities database, comprised of over 400 variables for 13,000 companies from 1970 through 2019. From this dataset, we set out to better understand what factors drove security returns during each crisis, and what factors an ideal portfolio should be exposed to. The factors we tested included:

- Value metrics (multiples, cash flow yields, etc.)
- Growth metrics (sales growth, profitability growth, etc.)
- Quality metrics (efficiency ratios, profitability, improvement in ratios)
- Leverage metrics (leverage ratios, balance sheet health, debt paydown, etc.)
- Piotroski F-score metrics (testing for likelihood of default)
- Security metrics (size, volume, prior momentum, industry)

To understand what works in bonds, we relied on Verdad's proprietary bond database. The database begins in 1996, so our analysis is limited to the most recent five crises in 2000, 2008, 2010, 2012, and 2016. Our database contains data between 1,200 and 2,000 companies and thousands of bonds each month. Once we narrowed the dataset to the high-yield segment of interest, we looked at an average of 350 companies per crisis. We constructed multiple value, momentum, growth, quality, leverage, trend, and security-specific metrics to test across the five crises. Bond returns and descriptive data were consolidated to the company level so that results are company weighted.

By examining each of the eight high-yield events since 1970, we have sought to understand what fundamentally drives market price movements, and how educated and prepared investors can take advantage of these times of panic. Our sample size of eight events triples the data points that most active investors have to rely on from their own personal experience, and allows us to draw connections between events and better understand relationships that functioned only in crises that investors might otherwise ignore.

In the following pages we lay out the details of what did and what didn't work during these periods of maximum uncertainty. The work we show below relies on strict quantitative rules. We are not relying on our judgement to time market entrance and exit, instead relying on simple and repeatable rules.

There are instances in which the strategy does not work as well. Sometimes the timing is a little early or a little late. Every high-yield event or recession has its own idiosyncrasies, which we explore in detail. But what we have laid out here is the strategy of what has worked generally during these time periods. Great quant strategies can be effective 55% or 60% of the time, and a stellar fundamental stock picker might have a similar track record. Crisis investing – and the specific factors we propose – can be effective between 75% and 90% of the time, which is about as predictable as the real world gets. And importantly, when these strategies work, they work exceptionally well. There are no guarantees in investing, but the findings we present below suggest that deploying capital in a smart way during crises is as close to the proverbial "fat pitch" as investment opportunities come.

WHAT WORKS BY ASSET CLASS

We first looked at how different asset classes perform when high-yield spreads are above and below 6.5% to get a sense for how they perform during tranquil times and periods of panic. Small value stocks outperform other asset classes when spreads are below 6.5%, but vastly outperform when spreads are at or above 6.5%. The results by asset class are shown below.

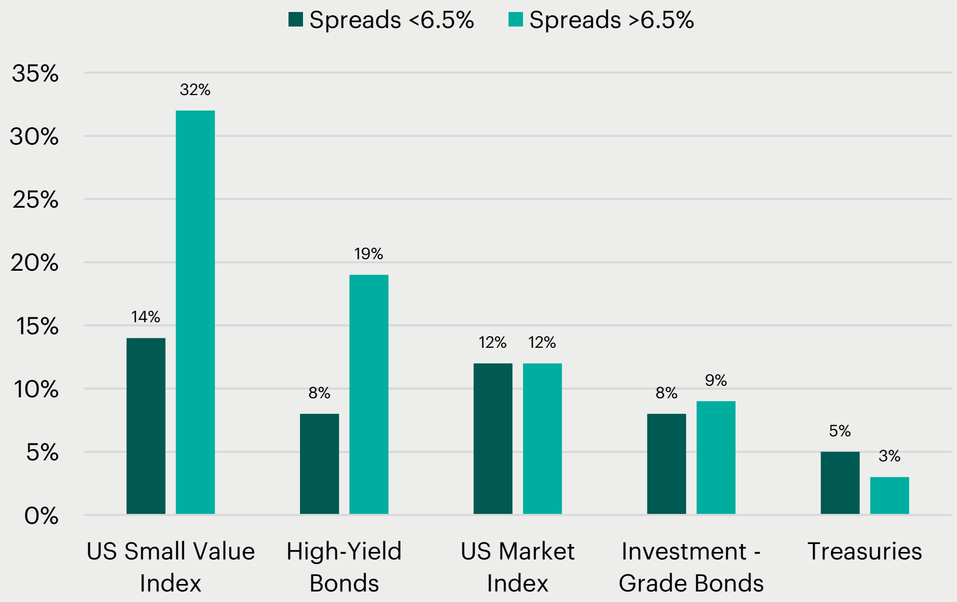


Figure 5:
Avg. Returns by Asset Class While Spreads Are Above and Below 6.5%

Source: CapitalIQ

Not surprisingly, high-yield bonds perform in line with investment-grade bonds when spreads are low (or rising to 6.5%) but perform well when spreads are high (or falling to below 6.5%). The US market and investment-grade bonds perform roughly in line before and after, and treasuries are the lowest yielding asset class both when high-yield spreads are low and high. Regardless, the best performing asset class during these periods has historically been small value stocks by a country mile.

Alternative Assets

Investors might plan to take advantage of the next crisis through private alternatives like private equity and distressed debt. In fact, many investors have private equity and distressed debt allocations to take advantage of precisely these moments of panic in the markets. We consider both alternatives.

Private Equity

Unfortunately for investors in private equity, private equity firms essentially stop deploying capital when high-yield spreads rise above 6.5% – which is also the time when returns in private equity are the best. High-yield spreads had a – 69% correlation with quarterly private equity deal volume from 2006-2018, shown in Figure 6. When spreads are high, debt financing is hard to acquire, and deal volume plummets. When markets are in freefall, most private equity investors will wait for things to settle before resuming deal flow, instead of buying the most distressed assets at the optimal time.

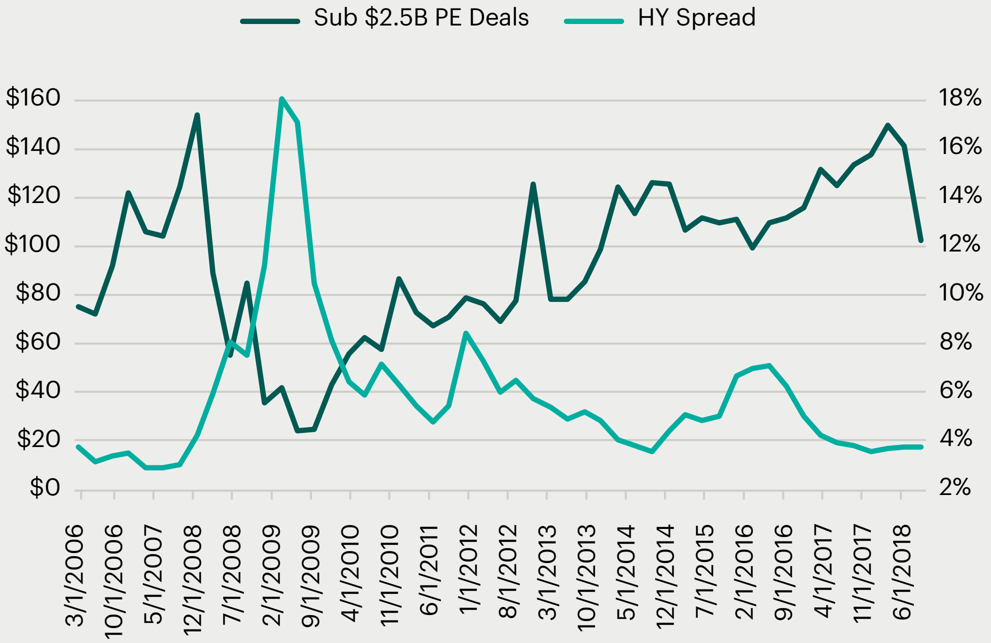


Figure 6:
Private Equity Deals <$2.5B in EV vs. High-Yield Spreads

Source:
Fred, Pitchbook

Investors with large PE allocations therefore find their capital flows are pro-cyclical, investing the most money when debt is cheap and multiples are high and the least money during times when the high-yield spread is wide and deal valuations are low.

Even for the most prepared and disciplined private equity investor, reacting in time to rising high-yield spreads would be extremely challenging. As we mentioned previously, equity returns are maximized in the 2-3 months after high-yield spreads hit 6.5%. It would be near impossible for a private equity investor to deploy meaningful amounts of capital into multiple opportunities in 2-3 months while borrowing rates for debt are rising.

In terms of returns, private equity vintage year returns are significantly higher in years where the high-yield spread is over 6.5%. The average IRR for a vintage year where spreads averaged over 6% is 17% versus 12% for a vintage year where spreads averaged below 6.5%.

But if we compare private equity vintage year returns and 12-month forward returns on the Cambridge Associates Private Equity Index to Fama-French Value or our multi-factor model (which we will describe below), we see that performance is significantly worse.

	Multi-Factor Model	Fama-French Value	PE Vintage Funds	PE Index
12/31/2000	86%	37%	22%	(12%)
3/31/2008	(43%)	(53%)	20%	(24%)
4/30/2010	17%	(1%)	16%	23%
8/31/2012	65%	43%	15%	18%
2/29/2016	55%	53%	14%	18%
Average	36%	16%	17%	5%
Average ex 2008	56%	33%	17%	12%

Figure 7:
Performance by Strategy during High-Yield Events

Source: Verdad analysis; Ken French data library; Cambridge Associates

In summary, while private equity seems like it should be an ideal asset class to take advantage of these opportunities, higher borrowing costs, short windows of opportunity, and high degrees of uncertainty prevent private equity from acting.

Distressed Debt

Distressed debt would seemingly be the optimal asset class to take advantage of times of financial distress. Distressed funds will opportunistically invest in the debt, equity, or trade claims of companies in financial distress or already in default. Distressed funds can take advantage of these opportunities by buying stakes at considerable discounts to their proper value.

Given this mandate, they could outperform during periods of uncertainty. However, the performance of distressed funds as shown below lag even the CCC index. The multifactor equity model we will discuss below outperforms distressed debt by 4.5x (8% vs. 36%).

	Barclays Distressed Index	CCC Index	BB Index
12/31/2000	17.1%	(0.9%)	11.1%
3/31/2008	(26.6%)	(34.2%)	(11.1%)
4/30/2010	11.7%	15.1%	12.8%
8/31/2012	17.0%	13.5%	4.9%
2/29/2016	22.1%	53.2%	15.2%
Average	8.2%	9.3%	6.5%

Figure 8:
Performance of Distressed Funds and Debt during High-Yield Events

Source:
FRED, BarclayHedge

In the most optimistic case, distressed funds may be outperforming the CCC index before fees, but the fact remains that the returns lag far behind the multifactor model. Distressed investing underperforms the multifactor model because the multifactor model is buying companies that are cheap and healthy whereas the distressed debt funds are buying businesses that are in an unhealthy, precarious, high bankruptcy risk situation. With a lower default or bankruptcy rate than distressed fund portfolios, it should be no surprise that the multifactor model outperforms.

In summary, neither private equity nor distressed debt funds are the right vehicles to take advantage of these opportunities. Given the significant outperformance of small value during these time periods, a dedicated public small value exposure is the optimal way to capitalize on these moments.

However, deciding to allocate to public small value during these time periods is likely not enough. To ensure that capital is put to work during these events, funds should commit to having a dedicated allocation that is drawn down when high-yield spreads hit a certain threshold, similar to private-equity-style commitments. This would suggest that even during the most trying times, investors have the discipline and structure in place to take advantage of these truly unique opportunities.

WHAT WORKS IN STOCKS

We believe a good place to maximize returns during a crisis is in small-value equities. We wanted to understand in more granular data what specific factors predicted performance within equities in order to develop the optimal strategy within the best returning asset class.

We started with a specific set of hypotheses, based on our experience and understanding of what has worked historically for small-value equities, and what factors have the most explanatory power in forecasting returns. Our high-level hypotheses were as follows:

- Cheap stocks outperform expensive stocks in times of uncertainty
- The greatest opportunities for price dislocation come from panicked sellers in low-volume stocks
- Companies generating positive cash flow, who are less reliant on capital markets, will perform better than companies with negative cash flow
- Leverage increases the dispersion of outcomes, and can be both good and bad

We regressed forward 12-month returns against the factors listed above across the eight crises, and a summary table of the regression results, including the most impactful factors, are shown below:

Regression: 12mo Return on Time-Fixed Variables			
Variable	**t value**	**|t|**	**Significance**
Asset Turnover	9.03	9.03 ●	0.00%
Positive Net Income	8.96	8.96 ●	0.00%
Volume	(8.87)	8.87 ●	0.00%
Value Composite	8.25	8.25 ●	0.00%
Positive Cash Flow	4.38	4.38 ●	0.00%
(Intercept)	(3.40)	3.40 ●	0.07%
Decreasing Leverage	2.71	2.71 ●	0.68%
Net Debt / EV	(2.41)	2.41 ●	1.58%

Adjusted R^2	0.35
Degrees of Freedom	19,032

Figure 9 :
Regression Results for Predictive Variables during High-Yield Crises

Source:
Verdad analysis

As a reminder, t-stats and significance levels are measures of whether a variable helps describe differences in returns. The more extreme the t-stat, the more impactful the variable in describing differences in returns. Each of the variables above is important in describing differences in returns. The implications from the above table are significant. Across these eight crises, this short list of variables accounted for over 35% of the fluctuations in future returns. Given the power of each of these variables, we will explore the impact they have on returns and discuss why each of these variables work.

Asset Turnover

Asset turnover is the most predictive variable the regression identified. Asset turnover is defined as revenue/assets and is a basic measure of return on investment and capital efficiency. Companies that are most efficiently using their assets to generate sales are likely to be better positioned than those who do not.

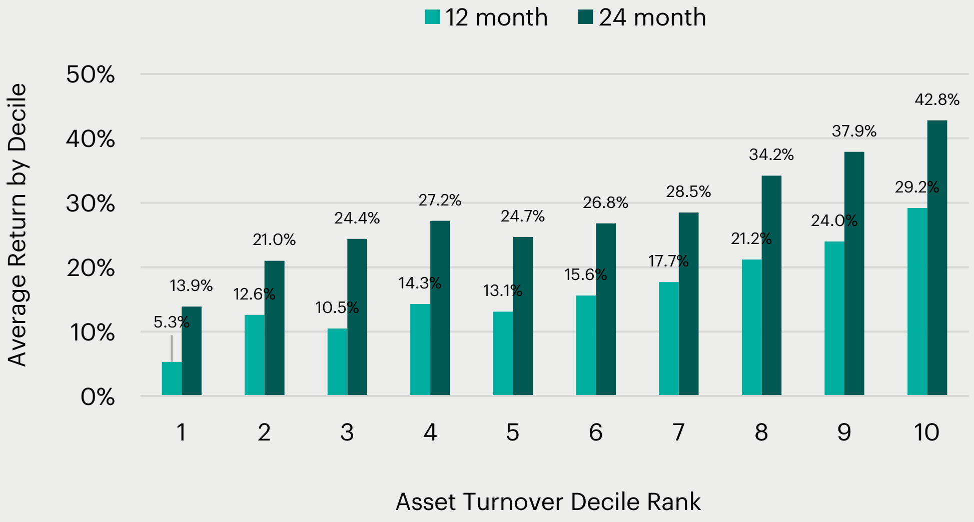


Figure 10:
Forward Returns by Decile for Asset Turnover

Source:
Verdad analysis; CRSP/Compustat

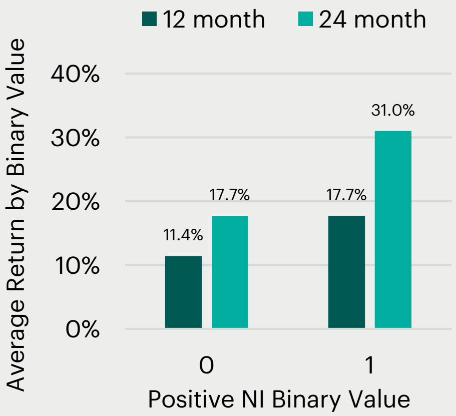
The linear relationship between increasing asset turnover and increasing returns is plainly evident in the above chart. The highest-ranking decile of companies by asset turnover generates the highest forward 12-month and 24-month returns. High asset turnover can be viewed as a proxy for high return on capital. In times of crisis, investors want to be buying businesses that they know will make the most efficient use of the resources they have available.

Positive Net Income

The Positive Net Income variable is simply a binary variable that classifies companies by whether they generated positive net income in the last 12 months. Companies that are generating positive net income going into times of crisis tend to do materially better than companies that are generating losses, as seen in Figure 11.

As shown in Figure 11, companies that are generating positive net income generate returns ~50% higher than companies that do not generate positive net income. This is consistent with our hypothesis that companies generating positive net income and cash flow, who are less reliant on capital markets in times of stress, will perform better.

Figure 11:
Forward Returns by Decile for Positive Net Income



Source:
Verdad analysis; CRSP/Compustat

Volume

Our hypothesis here was that low volume stocks will have greater opportunities for price dislocations in times of stress and will therefore generate higher returns. We defined volume as the monthly number of shares traded divided by the total number of shares outstanding. As evidenced by Figure 12, lower volume stocks considerably outperform higher volume stocks. This makes sense, since in times of panic when everyone is a seller, shareholders in low volume stocks are required to liquidate at any price if they want to get out of their position. By taking advantage of this dynamic, smart investors can reap significant rewards.

The lowest decile of volume stocks had an average return of ~30% over 12 months, and ~55% over 24 months. Perhaps not surprisingly, there is a high degree of correlation between low volume stocks and company size. Most of the lowest deciles of stocks by volume happen to be small and micro-cap companies.

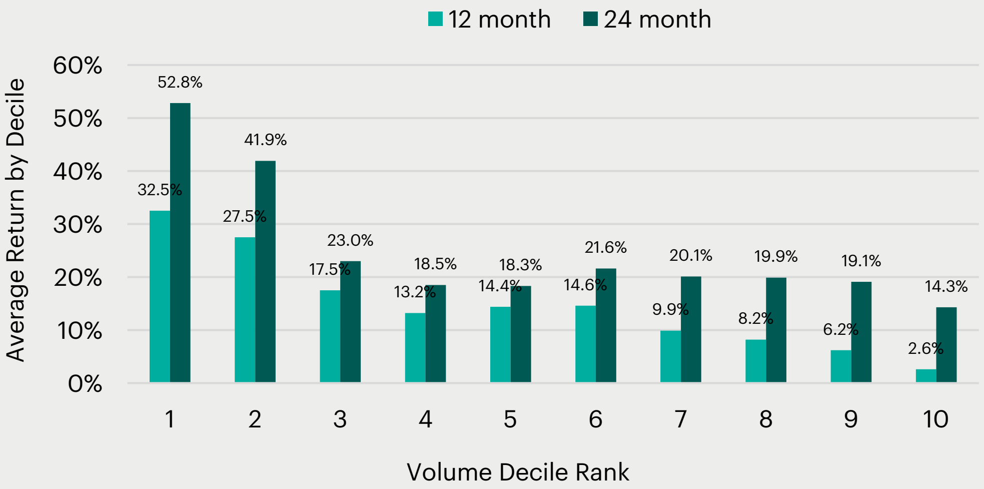


Figure 12:

Forward Returns by Decile for Volume

Source: Verdad analysis; CRSP/Compustat

Value Composite

Our value composite is defined as an equal weighted combination of: EV/EBITDA, P/B, P/E, and FCF yield. This value composite factor is one of the strongest signals we found in terms of spreading returns between deciles. Our hypothesis was that cheaper stocks would outperform expensive stocks in times of uncertainty, and the results are shown in Figure 13, with 1 being the most expensive decile of stocks, and 10 being the cheapest.

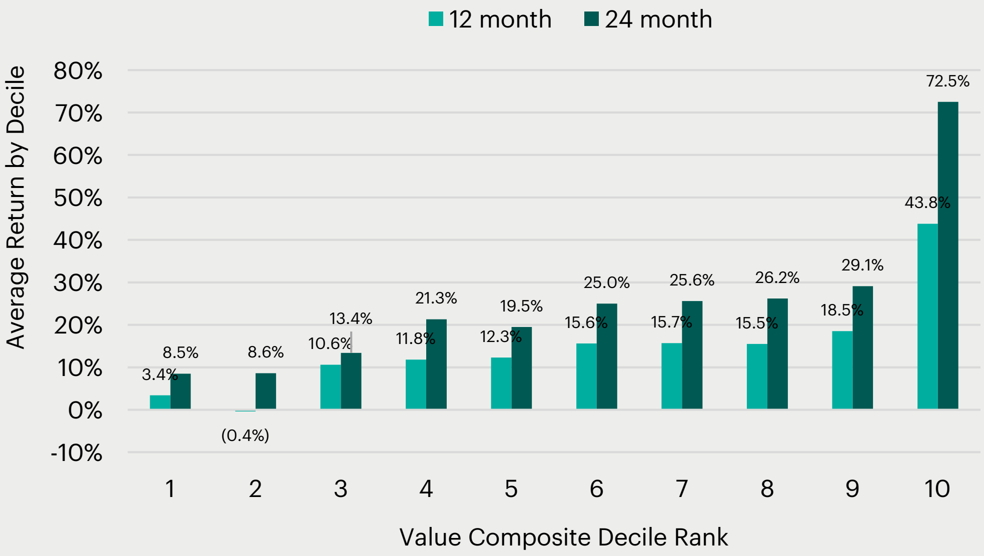


Figure 13:

Forward Returns by Decile for Value Composite

Source: Verdad analysis; CRSP/Compustat

Buying cheap stocks is one of the most effective things an investor can do during times of panic in order to assure high future returns. Importantly, returns are concentrated in buying the cheapest decile of stocks and avoiding the most expensive stocks. With 12-month returns of ~40% and 24-month returns of ~70%, the cheapest decile of stocks performs extremely well.

Positive Operating Cash Flow

Like positive net income, we predicted that companies that generated positive operating cash flow would perform better than companies that did not. As shown in Figure 14, this hypothesis proved to be true.

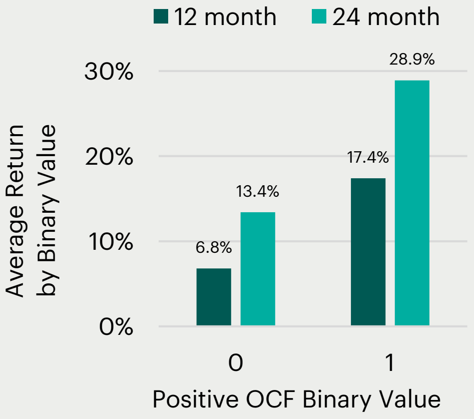
Companies with positive operating cash flow return roughly double what companies with negative operating cash flow return. Intuitively this makes sense since companies that do not need to access capital markets to fund operations should perform better than their peers which are not insulated from rising borrowing costs.

Decreasing Leverage

Our hypothesis for leverage was that leverage would increase the dispersion of returns, which we will explore in the next section. However, it is important to note that for companies with leverage on their balance sheet, deleveraging is beneficial for returns. Companies that can deleverage during times of stress show healthy operating characteristics, and by paying down debt they are reducing the default risk for equity holders.

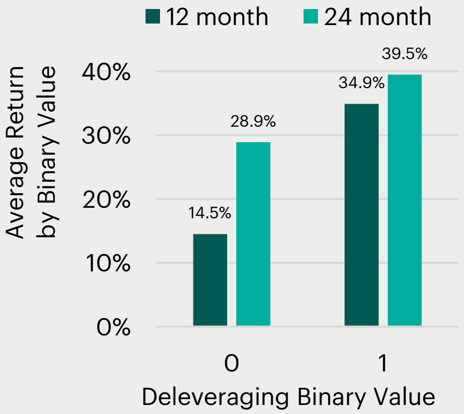
For companies with debt on their balance sheet, companies that deleverage accrete meaningfully more returns than their peers. Notably, this impact is most evident over the 12-month forward return window.

Figure 14:
Forward Returns by Decile for Positive Operating Cash Flow



Source:
Verdad analysis; CRSP/Compustat

Figure 15:
Forward Returns by Decile for Deleveraging Companies



Source:
Verdad analysis; CRSP/Compustat

Net Debt/Enterprise Value

We predicted that leverage would increase the dispersion of outcomes, which is proven out through two different mechanisms. The chart in Figure 16 shows that companies with higher levels of debt relative to enterprise value achieve higher returns.

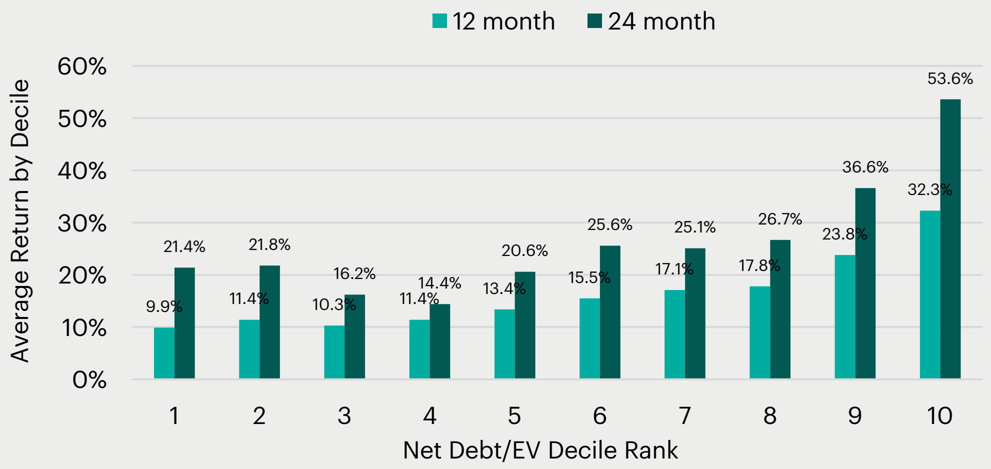


Figure 16:
Forward Returns by Decile for Net Debt/Enterprise Value

Source:
Verdad analysis;
CRSP/Compustat

However, the coefficient in our regression is negative, suggesting that lower levels of leverage are better. Notably, the regression is adjusting for differences between each high-yield event, such that the idiosyncrasies of any one event are not overly impacting the regression coefficients and t values. In summary, higher levels of leverage can increase average returns, but can also lead to a higher number of defaults. When combined with other factors like positive cash flow, high asset turnover, debt paydown, and a high value measure, adding leverage can increase returns by exposing investors to the right tail of leverage-amplified return outcomes.

Building the Optimal Model for Investing in Equities during a Time of Crisis

Each of the variables above has explanatory power on its own, as shown by the linear spread of returns by decile. It should come as no surprise that combining each of these individual factors into a multifactor model should enable us to generate superior returns. As shown in Figure 17, the multifactor model does indeed outperform both the market as a whole, and a dedicated value-only strategy (defined as the cheapest decile of the value composite factor).

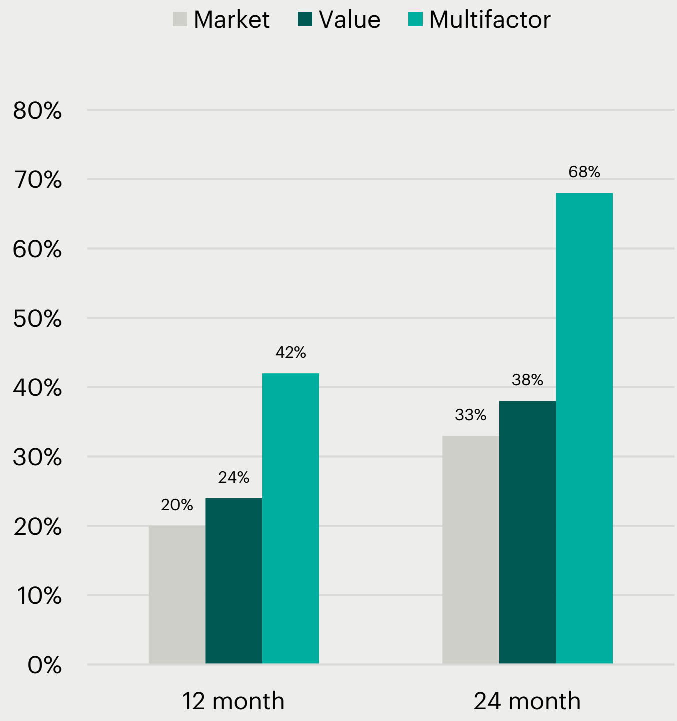


Figure 17:
Average Portfolio Return through High-Yield Events

Source: Verdad analysis; CRSP/Compustat

Note: Returns shown are the average of each of the eight high-yield events from 1974-2016

As shown in Figure 17, the multifactor model returns 2x the market over the 12-month and 24-month period. Additionally, the multifactor model returns roughly 2x what a dedicated value-only strategy would return.

While the returns and explanatory factors shown in Figure 18 below may be compelling, it is worth examining what the multifactor portfolios would look like relative to the market and other benchmarks. In this section we compare how a 50-company portfolio generated by the multifactor model would compare against the total market and a value portfolio of the cheapest decile of stocks. The statistics computed below are the average of each portfolio across the eight high-yield events. We have adjusted volume and market cap to account for higher market caps from inflation in more recent times, and higher market volumes as well.

Characteristics	US Market	Cheapest Decile	Multifactor Model
Security			
Mkt Cap (mean)	6,463	4,022	571
Volume (% of CSO)	19%	21%	7%
Prior 12mo mom.	13%	(1%)	4%
Financials			
Asset turnover	1.05	1.15	1.83
Net Debt / EV	0.3 x	0.2 x	0.5 x
Valuation			
EV / EBITDA	7.4 x	3.8 x	4.1 x
Price / Book	1.4 x	0.8 x	0.6 x
Price / Earnings	33.5 x	7.0 x	5.4 x
Returns			
Forward 12mo return	15%	22%	42%
Forward 24mo return	25%	32%	65%

Figure 18:
Portfolio Comparison

Source:
Verdad analysis;
CRSP/Compustat

As the table in Figure 18 shows, the multifactor model tends to favor companies that are smaller, more thinly traded, and with less positive prior momentum. These companies tend to also have high asset turnover and more leverage than the market, or the cheapest decile of stocks.

Interestingly, the multifactor model also selects companies that are very cheap across all four value metrics, even compared to the cheapest decile portfolio. It is worth noting that the cheapest decile portfolio includes ~400 stocks, whereas the multifactor model includes only 50. Most importantly, the returns for the multifactor model across the eight high-yield events are materially higher than the US market or even a pure value strategy.

Illustrative Investment

The portfolio characteristics section in Figure 18 gives a sense of the types of companies that the strategy would invest in, but to make the strategy more tangible, we have outlined a couple illustrative investments that would have been included in the 2016 multifactor model fund. Figure 19 is a profile of Ryerson Holding Company (RYI). Further profiles of a representative investment are shown in each of the historical high-yield event profiles.

Figure 19:
Profile of Ryerson Holding Company

Basic Company Info			
Name:	Ryerson Holding Corporation	HQ:	Chicago, IL

Description
Processes and distributes industrial metals in North America and China. Ryerson serves industries comprising transportation manufacturing, metal fabrication, industrial machinery, construction equipment, and oil and gas.

Capitalization Info	
Market Cap	119
Net Debt	958
Enterprise Value	1,163
Prior 12mo mom.	(44%)

Financials	
Revenues	3,167
EBITDA	161
NI	51

Multiples & Ratios	
Asset turnover	1.85
EV/EBITDA	5.1 x
P/B	NM
P/E	2.2 x

Leverage	
Net Debt / EV	0.8 x
Delevering?	No

Returns	
12-month return	193%
24-month return	173%

Source:
Verdad analysis;
CRSP/Compustat

As the profile in Figure 19 shows, Ryerson is not a company that would have been a high-flying stock in 2015 when most investors were fleeing to safety. The company is highly levered, but has strong asset turnover, free cash flow yield, and is attractively priced. With positive operating cash flow and net income, Ryerson was an attractive investment for the strategy, and the returns more than compensated for the risk of investing in the company.

The kind of investments that the multifactor model favors are unquestionably not the most popular or well-known stocks. They are often small, with low liquidity, and can be in cyclical or beaten-down industries. However, by relying on the detailed and thorough empirical back-testing of the strategy across the last eight high-yield events, the committed investor can be confident in the strategy and the investments.

Considering the performance and persistence of the multifactor model, we hope that the power and significance of a quantitative study of crises has become evident. In times of panic, when everyone is a seller, there are tried and true rules that prepared and disciplined investors can follow to reap rewards. The performance of the strategy during each of the eight studied high-yield events is listed in Figure 20:

	12 months		24 months	
High-Yield Event	**Market**	**Multifactor**	**Market**	**Multifactor**
1974	59%	65%	121%	142%
1980	41%	52%	25%	48%
1986	9%	37%	3%	16%
2000	12%	86%	(2%)	85%
2008	(38%)	(43%)	0%	50%
2010	21%	17%	20%	2%
2012	23%	65%	49%	122%
2016	31%	55%	44%	77%
Average	**20%**	**42%**	**33%**	**68%**
Cumulative Alpha		**177%**		**282%**

Figure 20:
Performance of Multifactor Model vs. Market during Crises

Source:
Verdad analysis;
CRSP/Compustat

The strategy is not 100% effective. But it can be effective, and it far surpasses the average quantitative or fundamental-based stock picking strategy. The cumulative excess returns over the market show how significant taking appropriate advantage of these opportunities can be.

Investors should consider setting aside dedicated capital for precisely these opportunities. As the historical headlines below show, investors cannot plan on keeping their heads when panic strikes. By setting aside capital to take advantage of these opportunities, smart investors are buying insurance for when a rainy day comes. We hope the findings we have illustrated here will give investors confidence and the evidence to act decisively when the opportunity presents itself.

WHAT WORKS IN BONDS

High-yield crises are one of the few times in the market when it makes sense to reach for yield in credit. While we have strenuously argued that the best returns in debt are available in BB credit, high-yield crises are a time when lower-rated B and CCC credits outperform. While B and CCC credits typically provide too little incremental yield for increased risk, in times of high-yield crises, B and CCC provide ample incremental yield for the increased risk.

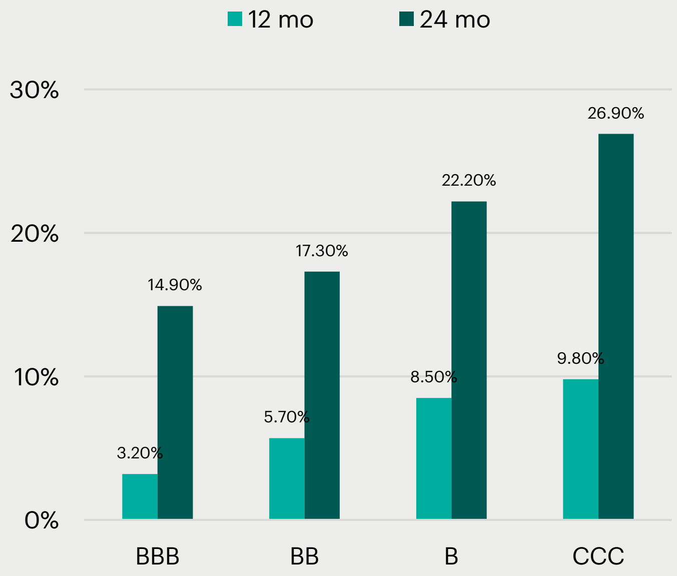


Figure 21:
Average 12- and 24-month Returns During Crises by Market-Implied Rating

Source:
Verdad bond database. Market-implied ratings are the ratings implied by bond pricing levels.

But just because risk is rewarded does not mean that investors can be indiscriminate in the reach for yield. The defining feature of high yield, decreasing incremental returns to risk, still exists in a crisis. The tipping point is just pushed further down the ratings spectrum. In Figure 22 we show the average yield and subsequent annualized two-year return by market-implied alphanumeric rating category.

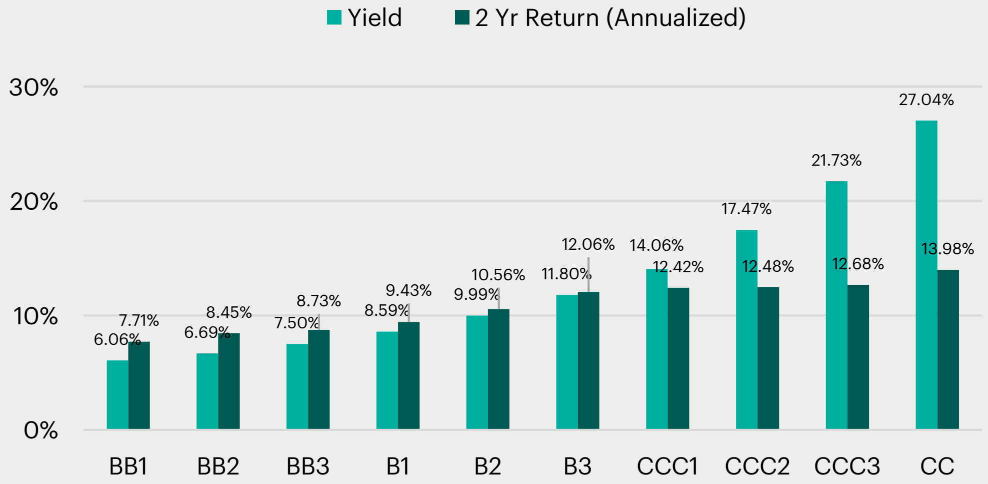


Figure 22:
Yield Versus Annualized 24 Month Returns During Crises

Source:
Verdad bond database.

There is still a high return for taking risk, but the dispersion of those returns increases for little gain as we go down the rating scale.

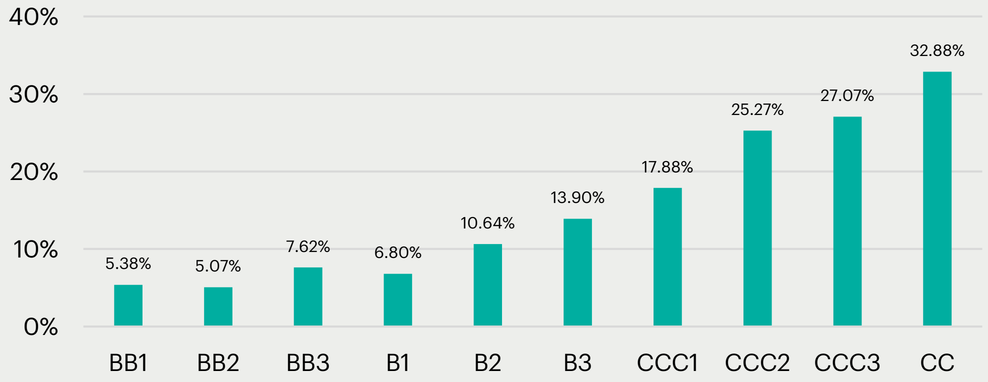


Figure 23:
Standard Deviation of Annualized 24-month Returns During Crises

Source:
Verdad bond database.

The implication of high standard deviations in the CCC space is that, while average returns are high, the variance of those returns is also very high, making it difficult to hold investments of that type. In a crisis, we want to reach for yield in the B and CCC space, but we don't want to be indiscriminate as we are investing in a space with significant default risk. What we want is a way to pick those bonds that will likely come close to earning their yield.

To achieve this, we use two-year annualized return divided by yield as an excess return measure. Using a ratio rather than a difference solves the problem that bonds with higher yields and returns naturally have higher differences and could tilt our model to riskier bonds.

Return Quintile	B1	B2	B3	CCC1	CCC2	CCC3	CC
1	0.2x	(0.1x)	(0.8x)	(1.3x)	(1.9x)	(1.8x)	(1.6x)
2	1.0x	1.0x	0.9x	0.8x	0.4x	(0.3x)	(0.4x)
3	1.3x	1.3x	1.3x	1.3x	1.2x	1.0x	0.8x
4	1.5x	1.5x	1.5x	1.6x	1.5x	1.5x	1.6x
5	1.9x	2.0x	2.0x	2.1x	2.4x	2.0x	2.1x

Figure 24:
Excess Return Measure (2 Yr. Annualized Return/Yield) by Rating and Return Quintile

Source:
Verdad bond database.

We then use our proprietary database of bond data to see what variables predict excess return across the five crises for which we have data. We restrict our data to B and CCC credit and regress our dependent variable against multiple financial metrics. Our cross-crisis regression includes dummy variables for each crisis to account for varying base rates of excess returns between crises. The most significant variables, excluding the crisis month dummy variables, are shown in Figure 25.

Variable	t	Significance
Public Equity (dummy)	5.4	0.0%
Sales Growth	(4.8)	0.0%
Yield	(4.4)	0.0%
Size (ln(assets))	3.9	0.0%
Free Cash Flow to Debt Ratio	3.1	0.2%
Return on Assets	3.0	0.2%
Rating Variance	(2.9)	0.3%

Adjusted R^2	0.14
Degrees of Freedom	1,757

Figure 25:
Regression Results for Predictive Variables During High-Yield Crises

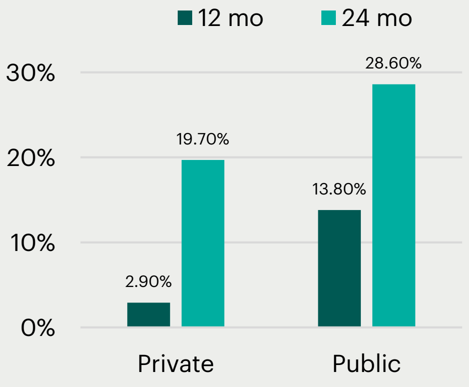
Source:
Verdad bond database.

Except for sales growth, the variables and the direction are all intuitive. Below, we discuss these variables in more details.

Public Companies

In times of stress, access to the financial markets is critical. We would expect that public companies, which have better access to capital, deeper investor bases, and better disclosure than private companies, would be better able to manage a crisis. The data bears this out. Public companies have substantially better performance than private companies, as shown in Figure 26

Figure 26:
Returns for Public versus Private Companies



Source: Verdad bond database.

Public companies have an excess return (two-year return / yield) of 1.2x versus 0.7x for private companies. This variable is highly significant in every permutation or our regressions across all time periods and rating categories. Of all our findings, this is the most robust.

Sales Growth

Sales growth is the least expected result from the dataset as excess returns and absolute returns increase as sales growth decreases. This variable screened as significant in almost every regression we ran, including regressions constructed with different dependent variables and different rating groups, so it appears to be highly important. The first decile has a median sales growth of -31% while the top decile has a median sales growth of 63%. This result both suggests positive returns for recent big losers and negative returns for recent high-growth companies. While it is difficult to identify one single driver, it is likely that this result reflects reversal in selloffs of highly cyclical companies (that seemed to be the primary driver in 2016 due to the energy selloff) and a reversal of fortune for companies that were growing unprofitably either due to overspending or acquisition.

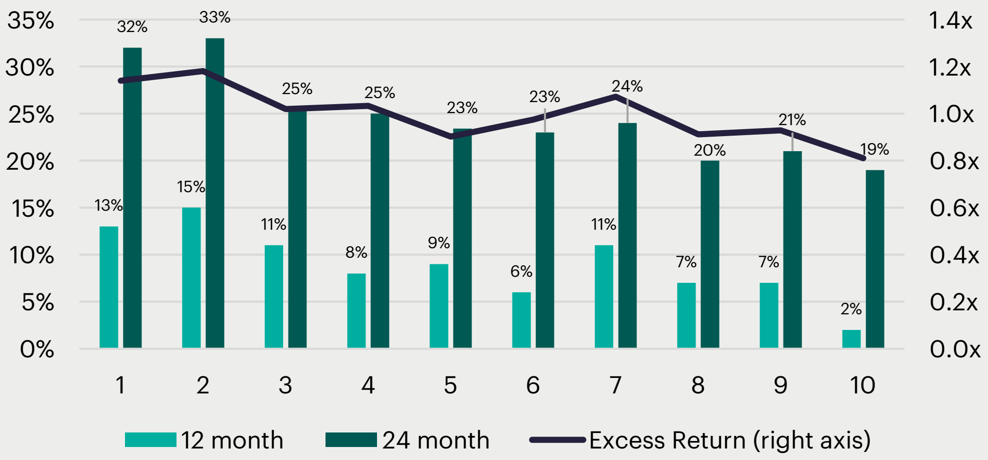


Figure 27:
Returns by Sales Growth Decile (1 = low, 10 = high)

Source:
Verdad bond database.

Yield

The negative sign on yield reflects that higher-yielding bonds (lower market-implied rating) are more likely to underperform by large amounts. This is evident in the declining excess returns in the chart in Figure 28. This variable will favor lower-yielding (higher rated) bonds.

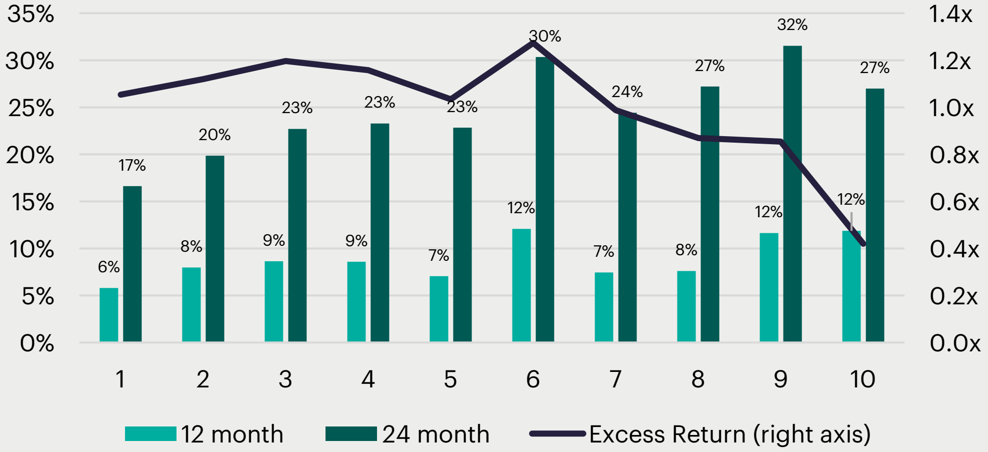


Figure 28:
Returns by Yield Decile (1 = low, 10 = high)

Source:
Verdad bond database.

Size

Size is highly related to default rate. Size reflects past success, and larger companies typically have more options than smaller companies, including cost-cutting, sale of hidden assets, and access to capital. While not as strong as the public/private variable, size acts in a similar way. Larger companies tend to be more creditworthy.

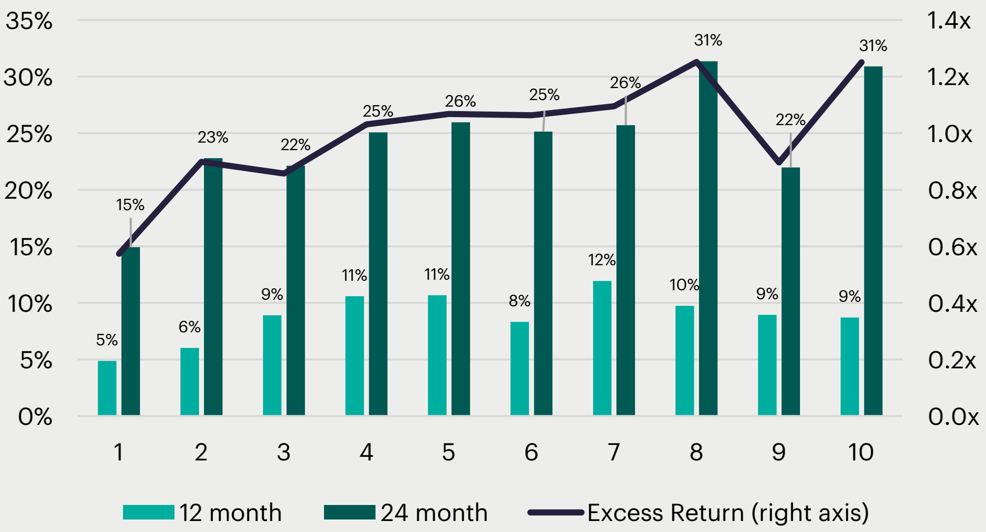


Figure 29:
Returns by Size Decile (1 = small, 10 = large)

Source:
Verdad bond database.

Free Cash Flow to Debt Ratio

Of the leverage metrics we tested, the ratio of free cash flow (cash from operations minus capex) to debt is the cleanest (as it is based on the cash flow statement) and tested the best. Other leverage metrics, including enterprise value to debt and debt to EBITDA, were not significant in our regressions. As is to be expected, returns improve as free cash flow to debt improves.

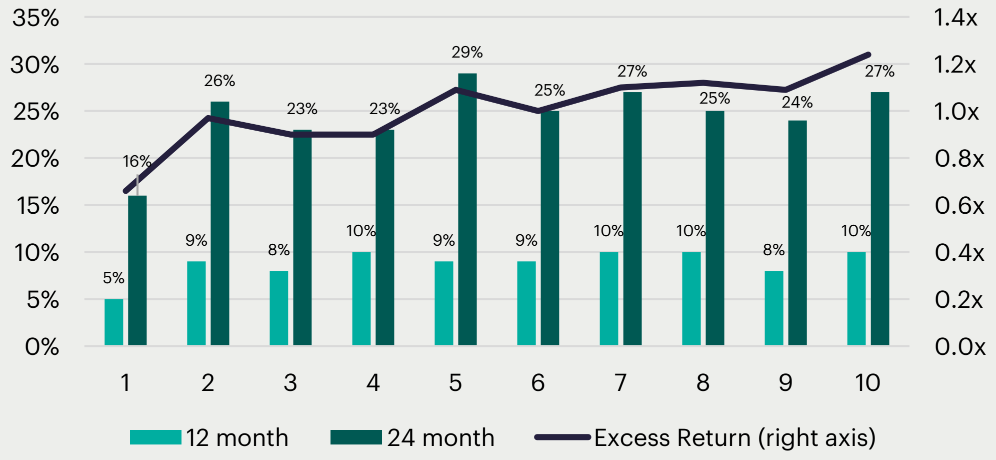


Figure 30:
Returns by FCF/Debt
(1 = low, 10 = high)

Source:
Verdad bond database.

Return on Assets

Return on assets, measured as EBIT adjusted for the statutory tax rate and divided by average assets, is one of the weaker variables we included in the regression. What is notable is that companies with very low (usually negative) return on assets have low returns. This variable does an especially good job when run in isolation on CCC credit.

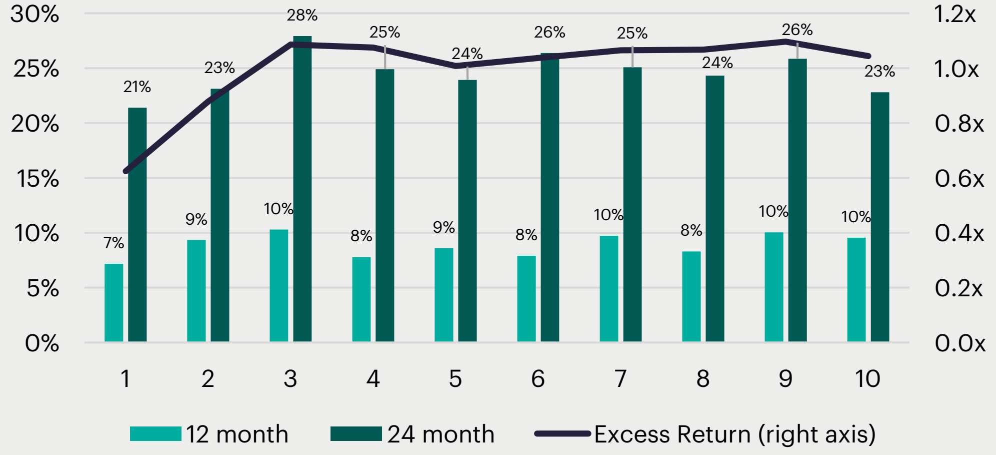


Figure 31:
Returns by Return on Assets
(1 = low, 10 = high)

Source:
Verdad bond database.

Rating Variance

Rating variance is the difference between the market-implied rating and the actual agency ratings for a bond. If it is negative, the bond trades wider (is cheaper) than the agency ratings imply it should. In this way, the variable uses the agency ratings as a measure of fair value. The negative t-stat (and coefficient) means that companies trading wide (cheap) are more likely to have higher excess returns.

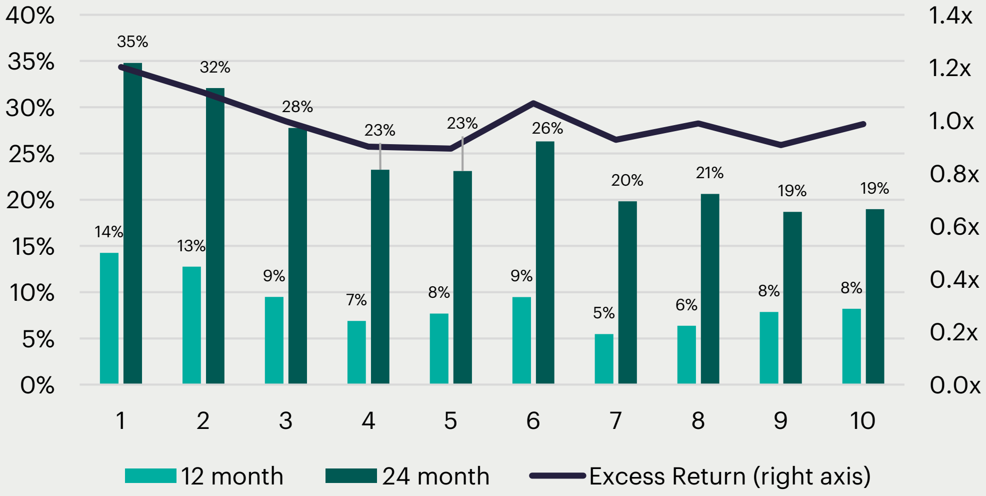


Figure 32:
Returns by Rating Variance (1 = cheap, 10 = rich)

Source:
Verdad bond database.

BUILDING A MULTIFACTOR MODEL FOR BONDS

It is clear from the above charts that each variable helps spread returns, but how do they perform together? To test this, we used the regression to generate in sample predictions of excess returns and then looked at returns by predicted excess return decile.

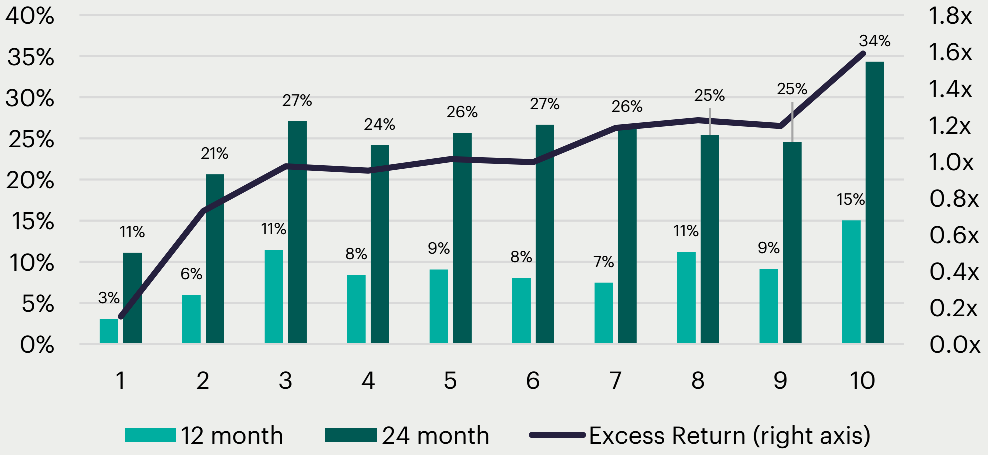


Figure 33:
Returns by Predicted Excess Return Decile (1 = low, 10 = high)

Source:
Verdad research

The model does a good job spreading returns, and the returns of the best decile compare favorably with what an investor could earn by just buying the CCC index. In most crisis periods, the top decile does better than the CCC index and always outperforms the B index.

	12 months			24 months		
High-Yield Event	**B Index**	**CCC Index**	**Multifactor**	**B Index**	**CCC Index**	**Multifactor**
2000	3%	(4%)	32%	4%	(14%)	48%
2008	(21%)	(38%)	(17%)	13%	18%	34%
2010	14%	14%	13%	21%	18%	21%
2012	8%	14%	9%	18%	27%	23%
2016	20%	46%	46%	25%	55%	53%
Average	5%	6%	17%	16%	21%	36%

Figure 34:
Returns versus Indices by Crisis Period

Source:
Verdad bond database and Bloomberg Barclays Indices.

What the model does extremely well, however, is deliver top-decile returns with lower risk. Figure 35 shows the standard deviation spread by predicted excess return decile.

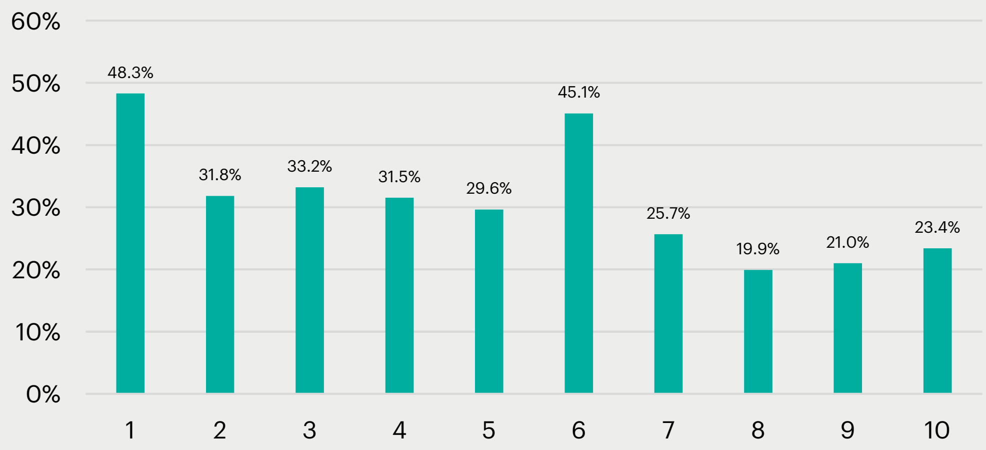


Figure 35:
Standard Deviation of Annualized 24-Month Returns for Credit Multifactor Model

Source:
Verdad bond database.

And as the chart in Figure 36 illustrates, the model is delivering CCC-like returns for single B-or-better risk. Compared with companies with B and CCC market-implied ratings, the multifactor portfolio (decile 10) has companies that are larger, more profitable, and less levered on average. What is notable is that the total returns of the multifactor portfolio meet or exceed those of companies with CCC market-implied ratings while starting off with significantly lower yields.

Characteristics	B	CCC	Multifactor
Financials			
% Public	60%	42%	97%
Revenue	3,295	2,310	10,292
GP Margin	36.1%	33.1%	29.1%
Total Assets	4,708	3,174	13,765
Return on Assets	3.9%	2.5%	4.5%
Leverage			
FCF/Debt	23.8%	(3.1%)	18.7%
Debt/Assets	53.1%	65.5%	37.8%
Risk and Return			
Market-Implied Rating	B2	CCC1	B2
Yield	9.4%	16.2%	9.5%
12-Month Return	9.2%	8.0%	15.0%
24-Month Return	22.4%	30.5%	34.3%

Figure 36:
Characteristics of Multifactor Portfolio versus Companies with B and CCC Market-Implied Ratings

Source:
Verdad bond database.

ANALYSIS OF INDIVIDUAL CRISES

1974 –
THE AFTERMATH OF BRETTON WOODS

“Sentiment [is] at an all-time low with no sign of turnaround”
– Wall Street Journal (12/12/1974)

President Ford’s budget implies “a steep fall in corporate profits and a rapid rise in unemployment.”
– Wall Street Journal (2/4/1975)

Summary

Inflation spiked in the early 1970s as a result of a combination of economic events. Nixon lifted wage and price controls, the demise of Bretton Woods system of monetary management allowed for free-floating currencies, and oil prices spiked as tensions with Iran turned into the Yom Kippur War. Meanwhile, the US economy was stagnating.

Yale economist James Tobin’s ratio of a company’s market cost to its replacement cost—called “q”—implies that stock prices should keep pace with inflation, since inflation increases the replacement costs of a company. However, in ’73 and ’74, inflation was 37% while stock prices declined a full 22%, a 59% displacement from Tobin’s theory. The wave of pessimism implied that the market as a whole was worth only 40% of its replacement cost. This is part of what makes this period of “stagflation” so exceptional.

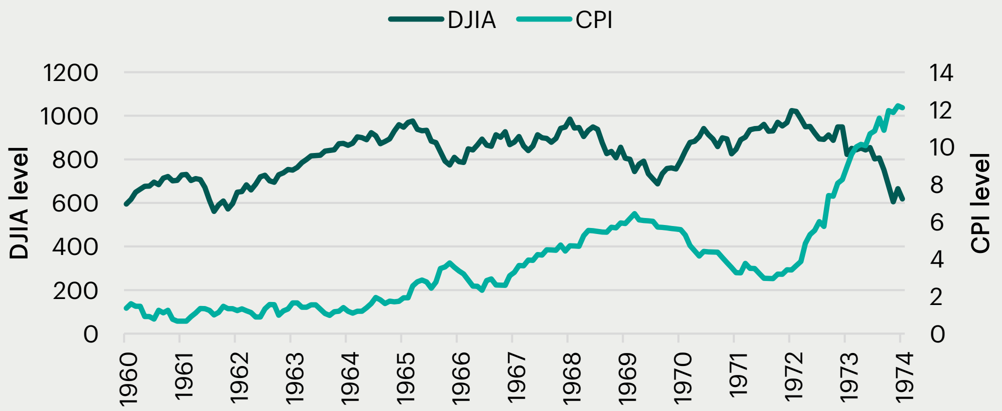


Figure 37:
Inflation and the Stock Market through 1974

Source:
FRED

As the chart above shows, inflation was spiking to above 12% per year while the total stock market was down ~50%, the same level as almost 15 years prior. This stagflation effect severely dampened investor enthusiasm for small value stocks, although the strategy performed well during this time period.

Industry Performance

Not surprisingly, all industries performed poorly going into the 1974 high-yield event, since rising inflation had severely pressured stock prices. However, the two worst-performing industries going into 1974 were the two best-performing industries coming out. They were industries that were better able to pass on rising costs to the consumer, whereas the worst-performing industry, mining, was unable to pass those costs along to the consumer.

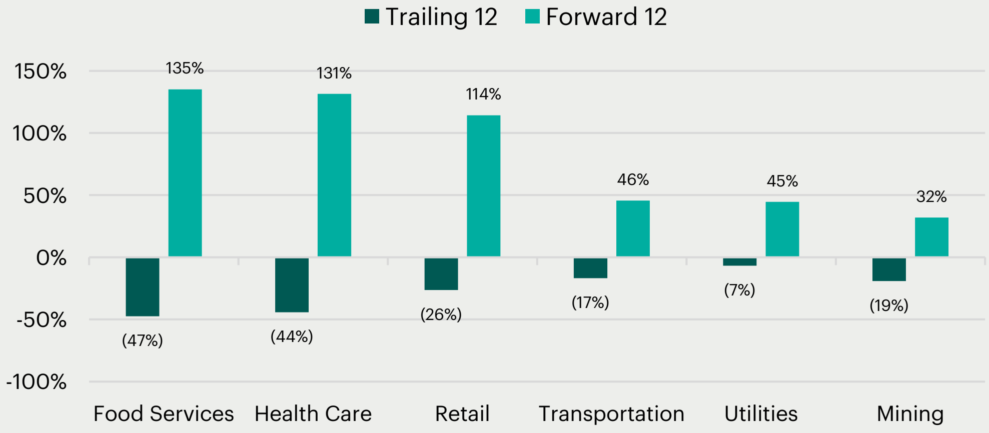


Figure 38:
Best and Worst Industry Performance during 1974 High-Yield event

Source:
Verdad analysis; CRSP/Compustat

Multifactor Model Performance

We can more precisely evaluate specifically what worked and didn’t work during this time period by examining the performance of each of the factor variables we laid out in the multifactor model and measuring how well each of them predicted performance during this time period.

The chart in Figure 39 shows that companies that ranked high on value did exceptionally well during the time period, both on a 12- and 24-month horizon. Additionally, companies with high asset turnover ratios performed well over 12 months.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	6.8	0.00	1.6	0.10
Positive NI	(3.5)	0.00	(5.7)	0.00
Volume	0.9	0.38	4.2	0.00
Value Composite	8.9	0.00	15.5	0.00
Positive OCF	(7.5)	0.00	(7.8)	0.00
Deleveraging	(1.1)	0.29	(2.0)	0.05
Net Debt / EV	0.5	0.61	0.4	0.66
Adjusted R^2	**0.09**		**0.17**	
Degrees of Freedom	**1,363**			

Figure 39:
Multifactor Model Performance during 1974 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Interestingly, companies that were generating positive cash flows did not perform as well as their peers whose operations were consuming cash. Given the inflationary environment at the time, net spenders would be advantaged over net savers, so in this environment generating positive cash flows may have hurt returns.

The total portfolio returns are shown in Figure 40, for the market as a whole, a value-only portfolio, and the multifactor model strategy. On a 12-month basis, the multifactor model performs slightly better than the market but outperforms value, and over the 24-month period, the multifactor model significantly outperforms both.

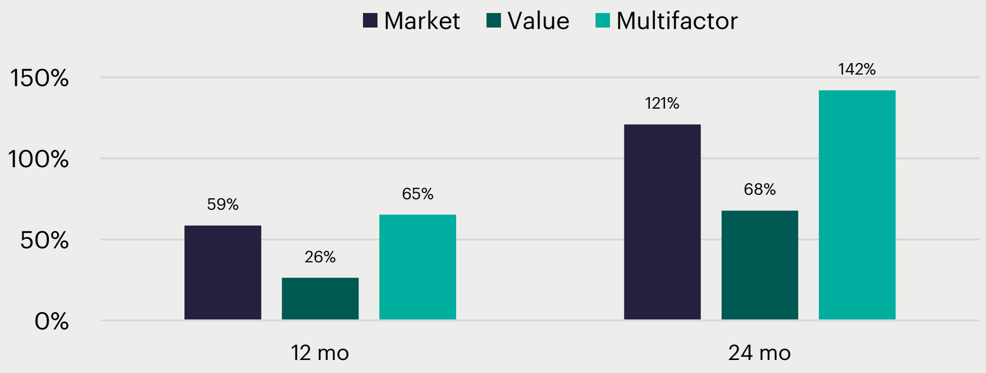


Figure 40:
Portfolio Returns during 1974 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

A sample investment that the multifactor model would have selected is shown in Figure 41.

Basic Company Info			
Name:	Oxford Industries, Inc.	HQ:	Atlanta, GA

Description

Oxford Industries, an apparel company, designs, sources, markets, and distributes products of company-owned and licensed brands worldwide. The company brands include: Tommy Bahama, Lilly Pulitzer, and Southern Tide.

Capitalization Info	
Market Cap	20
Net Debt	42
Enterprise Value	62
Prior 12-mo mom	(44%)

Financials	
Revenues	NA
EBITDA	27
NI	10

Multiples & Ratios	
Asset turnover	2.08
EV/EBITDA	2.3 x
P/B	0.3 x
P/E	1.9 x

Leverage	
Net Debt / EV	0.7 x
Delevering?	Yes

Returns	
12-month return	137%
24-month return	210%

Figure 41:
Illustrative Investment for 1974 Multifactor Model Portfolio

Source:
Verdad analysis;
CRSP/Compustat

Oxford Industries was one of the highest-ranked companies by the multifactor model and exhibited tremendous returns in the 12 and 24 months following high-yield spreads hitting 6.5%. Notably, Oxford is extremely cheap with healthy free cash flow yield and some healthy leverage.

1980 –

BITTER MEDICINE FOR INFLATION

"Have you been to an American shareholders' meeting lately? They're all old fogies. The stock market is just not where the action's at."
– Business Week, *"The Death of Equities"* (8/13/1979)

"Given the type of consistent high-level inflation we've been experiencing, the stock market represents speculation."
– Business Week, *"The Death of Equities"* *(8/13/1979)*

Summary

This was a "simple" recession, caused by a demand shock, in this case resulting from the Fed's contractionary monetary policy. When the Fed raised interest rates from 11% in 1979 to 20% in June 1981 in Fed Chairman Paul Volcker's aggressive plan to stop inflation, borrowing costs rose all around. As inflation declined, the economy needed a recession to adjust prices and wages in response to this drastic change from expected inflation.

In 1979, the price of oil had doubled as inflation moved into the double digits. This rise in interest rates was also the trigger for the Savings & Loan crisis, since a federal cap on S&L interest rates meant that they could not offer competitive interest rates on consumers' deposits. Economy-wide stagnation further entailed that very few people were buying homes and taking out mortgages, which was the core of S&Ls' business. From 1980 to 1982, 118 Savings & Loans with $43 billion in assets went under, leaving the federal government with a $3.5 billion expense.

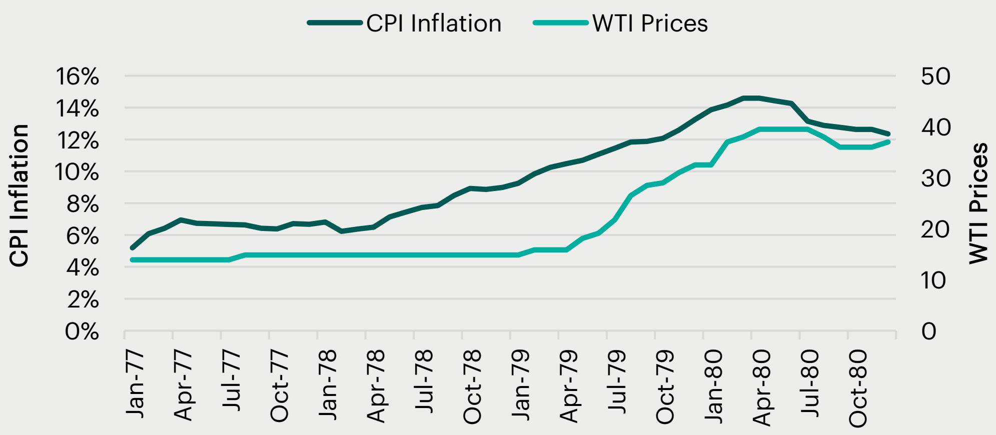


Figure 42:
Inflation and Oil Prices through 1980

Source: FRED

The rapid rise in both inflation and oil prices, more than doubling in three years, shocked consumers and sent the economy into a recession. Examining individual industries gives some more context into how various sectors of the economy handled the turbulent times.

Industry Performance

There was quite a range of outcomes by industry during the 1980 high-yield event. Several industries experienced strong performance reversal, with poor prior 12-month returns transitioning to strong forward 12-month returns. As investors regained confidence, those industries that were better able to pass on inflationary costs to consumers performed better.

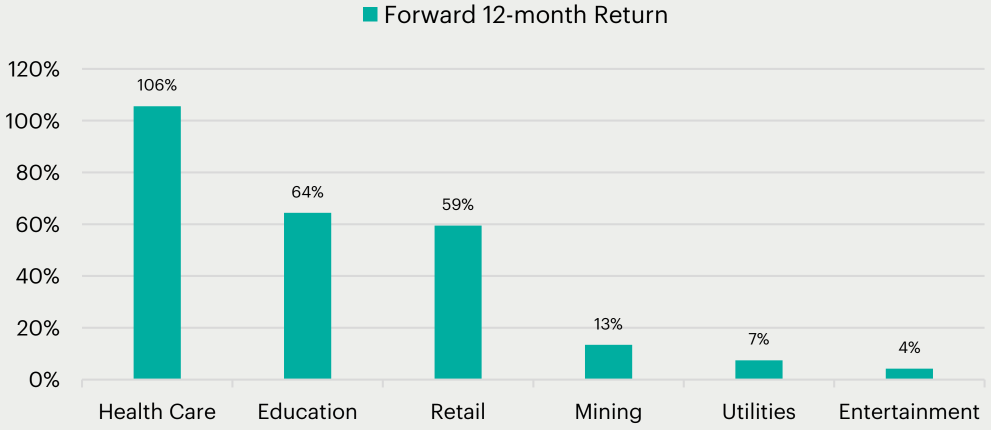


Figure 43:
Best and Worst Industry Performance during 1980 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Multifactor Model performance

Looking at each of the factors with predictive power during these time periods, we can see that both asset turnover and value were the two strongest predictive factors over both the 12- and 24-month periods. In general, however, the model had less predictive power during 1980 as evidenced by the lower adjusted R^2 values.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	5.9	0.00	2.8	0.00
Positive NI	1.4	0.15	0.1	0.94
Volume	(0.3)	0.79	(3.5)	0.00
Value Composite	2.0	0.05	7.5	0.00
Positive OCF	(4.3)	0.00	(7.7)	0.00
Deleveraging	1.6	0.11	(0.1)	0.94
Net Debt / EV	(0.1)	0.92	(0.9)	0.34
Adjusted R^2	**0.05**		**0.08**	
Degrees of Freedom	**1,475**			

Figure 44:
Multifactor Model Performance during 1980 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Similar to 1974, companies that were generating positive cash flows did not perform as well as their peers whose operations were consuming cash. Given the inflationary environment at the time, net spenders would have had an advantage over net savers, so in this environment generating positive cash flows may have hurt returns. Given the high rates in 1974, we saw a similar dynamic play out.

The total portfolio returns are shown in Figure 45 for the market as a whole, a value-only portfolio, and the multifactor model strategy. On a 12-month and 24-month basis, the multifactor model outperforms both the market and value. The fact that the multifactor model outperforms shows the advantage of combining value with other factors.

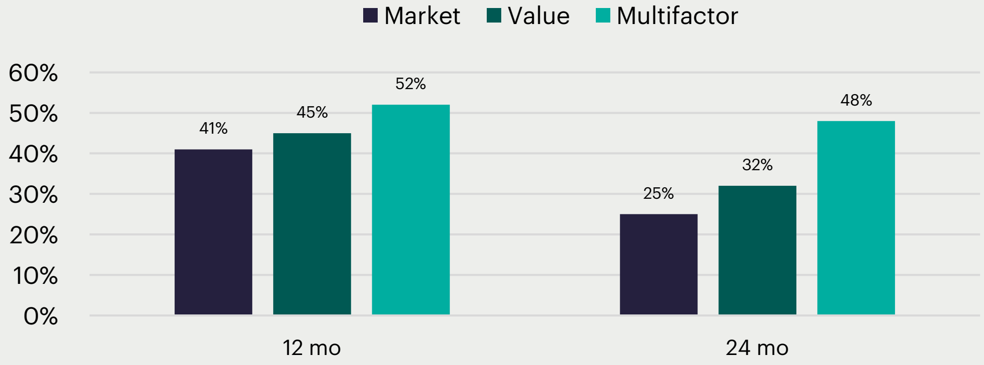


Figure 45:
Portfolio Returns during 1980 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

A sample investment that the multifactor model would have selected is shown below.

Basic Company Info			
Name:	PulteGroup, Inc.	HQ:	Atlanta, GA

Description
Primarily engages in the homebuilding business in the United States. The company acquires and develops land primarily for residential development, including single-family detached homes, townhouses, condominiums, and duplexes.

Capitalization Info	
Market Cap	45
Net Debt	51
Enterprise Value	96
Prior 12-mo mom	12%

Financials	
Revenues	NA
EBITDA	26
NI	14

Multiples & Ratios	
Asset Turnover	2.29
EV/EBITDA	3.6 x
P/B	1.0 x
P/E	3.1 x

Leverage	
Net Debt / EV	0.5 x
Delevering?	Yes

Returns	
12-month return	100%
24-month return	104%

Figure 46:
Illustrative Investment for 1980 Multifactor Model Portfolio

Source:
Verdad analysis; CRSP/Compustat

PulteGroup is a homebuilding company and was one of the highest-ranked companies in the multifactor model. Given how sensitive the homebuilding business is to interest rates, the declining rates after 1980 had a tremendous impact on improving conditions for PulteGroup. With a leveraged balance sheet but healthy cash flows, the equity was poised for explosive growth once conditions improved, as evidenced by the 12- and 24-month returns.

1986 –
SAUDI ARABIA TANKS OIL PRICES

"It's a madhouse. There is a huge panic out there, and where prices will go is anybody's guess."

– Andrew Avramides,
oil trader (1/22/1986)

"We're talking about a possible economic wipeout."

– Tim Richardson,
editor of political newsletter, talking
about the Texas economy (4/22/1986)

Summary

The illiquidity in 1986 was not precipitated by any trends in GDP or in the equity market. Though usually overshadowed by 1987's "Black Monday" stock market crash, 1986 brought a collapse in oil prices, which had ripple effects for liquidity throughout the economy. This period concluded the inflation in the price of oil that had started in 1973 with the fall of the Bretton Woods system, which had indirectly locked down the price of oil. In the early 1980s, oil prices fell due to non-OPEC entrants into the market. In response, OPEC collectively controlled their production to maintain previous prices. However, in December 1985, Saudi Arabia decided to derestrict their production to gain market share, since they were suffering the most from production restrictions. As a result, oil prices cratered 57% from $23.29 to $9.85 from December 1985 to July 1986. Discounted for inflation, the real value of oil fell almost 80% in this period. The daily overhang (supply in excess of demand) was often 10 million barrels.

The effects for parts of the U.S. economy were disastrous: in one year, the number of drilling rigs in the U.S. sunk from 2,300 to 1,000. In Houston, drilling rigs were being torn up and sold for scrap metal. In the oil industry, 100,000 people lost their jobs in the first four months of 1986 alone. Things were so dire for the oil industry that there were plans to turn offshore oil rigs into casinos and helicopter pads.

Liquidity tightened because of the heavy hit Mexico took as a leading non-OPEC producer of oil—they could not stay afloat at such low oil prices. American banks had lent around $27 billion to Mexico, and they could just default on those loans if oil prices stayed depressed.

In Texas, a state hit particularly hard by the oil crash, real estate values plummeted, but Savings and Loan operations kept the properties on their books at previous prices, which misled the public about their financial health. The eventual losses from Texas's Savings and Loans made up more than half of the S&L losses nationwide, further precipitating panic and crisis.

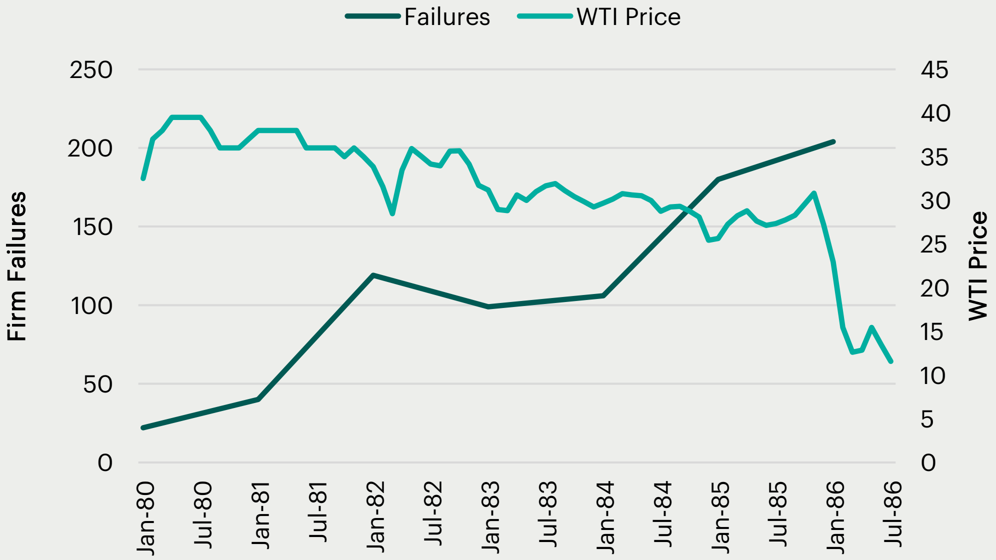


Figure 47:
Firm Failures and Oil Prices through 1986 High-Yield Event

Source:
FRED

The steep and quick drop in oil prices, coupled with the precarious position of the savings and loan industry, led to a rapid collapse of both the energy sector and a huge loss in consumer confidence. We can see this trend reflected in specific industry performance in Figure 48.

Industry Performance

For the most part, all industries performed relatively poorly coming out of 1986, in large part because the effects of low oil prices and the savings and loan crisis took more than a year to work through. There were a couple bright exceptions, namely mining, IT and waste management, whereas finance, health care, and construction lagged.

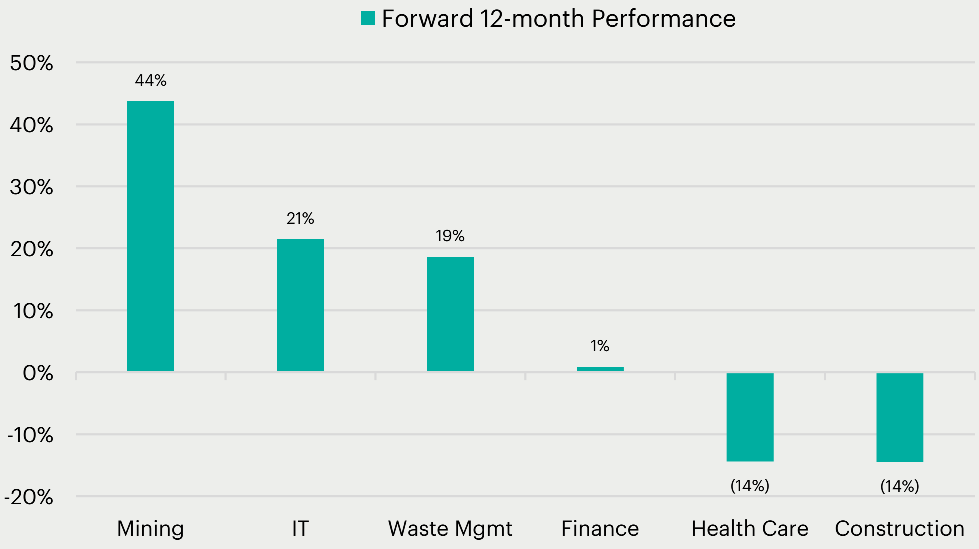


Figure 48:
Industry Performance during 1986 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Multifactor Model Performance

During this time period, several of the factors in the multifactor model displayed high predictive power. Most notably, value was a very positive signal, with asset turnover having more of a muted impact. Companies that were deleveraging and had slightly higher net debt ratios also performed better. Finally, companies with very low volume presented the greatest opportunities for price/value arbitrage and handsomely rewarded investors.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	1.4	0.17	1.9	0.06
Positive NI	0.5	0.65	1.7	0.08
Volume	(5.7)	0.00	(8.6)	0.00
Value Composite	7.2	0.00	11.2	0.00
Positive OCF	(1.9)	0.06	(4.5)	0.00
Deleveraging	2.6	0.01	2.8	0.00
Net Debt / EV	0.6	0.54	2.4	0.02
Adjusted R²	**0.06**		**0.13**	
Degrees of Freedom	**2,118**			

Figure 49:
Multifactor Model Performance during 1986 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Returns for the market, the value-only portfolio, and the multifactor model are shown in Figure 50. The multifactor model vastly outperformed over 12 months but had more muted performance over 24 months. In both time horizons it beat the market, but over 24 months the multifactor model trailed a value-only portfolio.

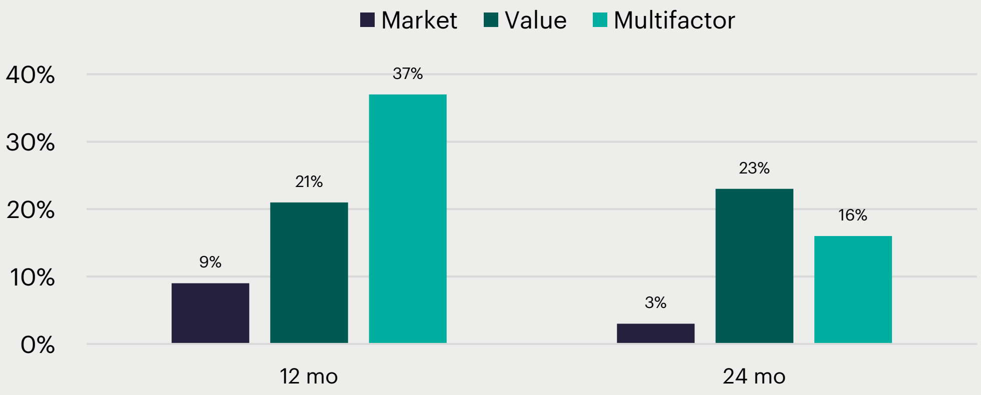


Figure 50:
Portfolio Returns during 1986 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

A sample investment that the multifactor model would have selected is shown in Figure 51.

Figure 51:

Illustrative Investment for 1986 Multifactor Model Portfolio

Basic Company Info			
Name:	ConocoPhillips	HQ:	Houston, TX

Description
ConocoPhillips explores for and produces crude oil, bitumen, natural gas, liquefied natural gas (LNG), and natural gas liquids worldwide. The company primarily engages in the tight oil reservoirs, LNG, and oil sands.

Capitalization Info	
Market Cap	2,413
Net Debt	5,281
Enterprise Value	7,694
Prior 12-mo mom	(12%)

Financials	
Revenues	10,018
EBITDA	3,316
NI	401

Multiples & Ratios	
Asset turnover	0.99
EV/EBITDA	2.3 x
P/B	1.4 x
P/E	6.0 x

Leverage	
Net Debt / EV	0.7 x
Delevering?	Yes

Returns	
12-month return	55%
24-month return	78%

Source:
Verdad analysis;
CRSP/Compustat

ConocoPhillips, as a producer of oil and natural gas products, had seen the price of its products crushed by the Saudi Arabia market flooding. The stock had drawn down 12% in the prior 12 months but was in an optimal position for growth. It was levered, was deleveraging, was extremely cheap by multiple metrics, and had healthy cash flows. While the sector was precariously positioned, taking advantage of the cheap opportunity more than adequately rewarded stockholders over the next 12 and 24 months.

2000 –
STRUCTURAL FLIGHT FROM TECH

"I'm sick to my stomach. I lost a fortune. I thought we were putting in a bottom. I have stocks that were down 15% to 20% on Friday and now people are telling me they are expensive."

– Seth Tobias,
hedge fund manager (3/13/2001)

"Bottom line, this is a crisis of confidence. I've never seen anything quite like it."
– Jay Tracey,
CIO of a Denver-based mutual fund (3/13/2001)

Summary

This recession followed the longest economic expansion the market had ever seen, which began nearly ten years earlier in March of 1991. This recession was structural, as one can see by its very mild effect on output alongside a jobless recovery—it took four years to return to previous employment levels. The recession was not structural in the usual sense of a "new era of technology," but of the structural shift of capital resources away from the overheated high-tech industry.

Columnist James Glassman and economist Kevin Hassett published a well-received book called Dow 36,000, in which they predicted that the Dow would hit 36,000 by 2004. They called for the eradication of the "old-fashioned" P/E ratio as a limit to equity prices, asserting instead a long-term equity risk premium of 0%. This book contributed to the popularization of investing and the increase in small, individual investors and people day-trading the market, which brought more exuberance to the tech bubble and deflated it more quickly when things began to look bad. “Small investors aren’t chipping in the $100 or $200 a month and the market feels that,” noted Paul D’Arienzo, a stock exchange floor broker, in 2002.

Though the fundamental economy did not suffer much because of the Fed’s proactive decision to raise rates through 1999 and 2000, the stock market endured terrible losses as the tech boom squealed to a halt. The crash of 2000 ended a time of low inflation, which had allowed the booming fledgling tech industry plenty of capital for expansion. Between March and September, the tech sector lost nearly $1.8 trillion in market value, and nearly every tech company was down 75% from its 52-week highs.

In response to recessionary signals in early 2001, the Fed quickly lowered rates down to 1.75% by December, keeping them low until 2004 and leaving banks looking for more lucrative sources of income such as mortgage-backed securities, which paved the way for the 2008 recession. This expansionary monetary action was not as effective as the Fed would have hoped, mostly because the economy had to work through a structural recession, not a simple demand shock.

The stock market plunged in response to the 9/11 terrorist attacks, keeping the New York Stock Exchange closed for four days afterwards. As much as this hurt the equities market, and gave the economy a negative demand shock, the consequent “war on terror” was pursued in Afghanistan, and eventually stimulated the economy with $23.9 billion in government spending.

The recession itself was brief, lasting only until November 2001, in this way resembling the 1969-1970 slump. Yet the stock market rose briefly, then reached an even lower trough in 2002. One explanation for this continued slump was the highly publicized bankruptcy of the telecommunications company WorldCom. A favorite of value investors through the tech craze, WorldCom filed for bankruptcy in July, after reporting billions of dollars in accounting errors. With $104 billion in assets, this bankruptcy was the biggest ever—double the size of Enron’s Chapter 11.

Unparalleled enthusiasm for the “next era” of technology and the potential disruptions it would have on business fueled inflation in multiples and valuations. Once market participants and the economy as a whole realized the lack of fundamental reality in the valuations, enthusiasm and the emerging tech economy quickly sputtered.

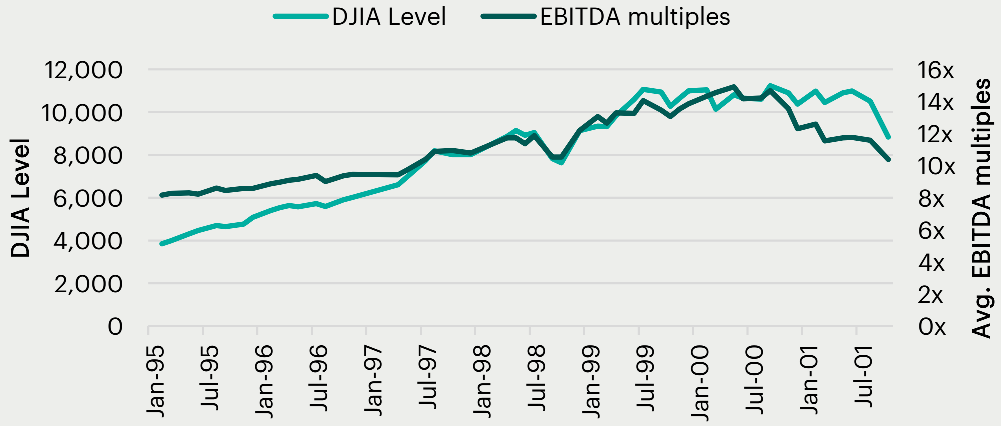


Figure 52:

DJIA and Average EBITDA Multiples through 2000

Source: CapitalIQ

Industry Performance

The 2000 recession saw considerable mean reversion for many industries. Technology got punished going into the recession and did relatively poorly in the 12 months coming out, needing a longer runway to recover. But broadly, the strongest performers were some of the weakest going into the recession, and the worst performers had seen very strong performance in the 12 months prior. The evidence of mean reversion shouldn't be too surprising given how powerful of a factor value is in determining individual security returns. For industries that are cheap (poor prior performance), they are expected to have better returns, for industries that are expensive (good prior performance), we expect them to have worse returns in the future.

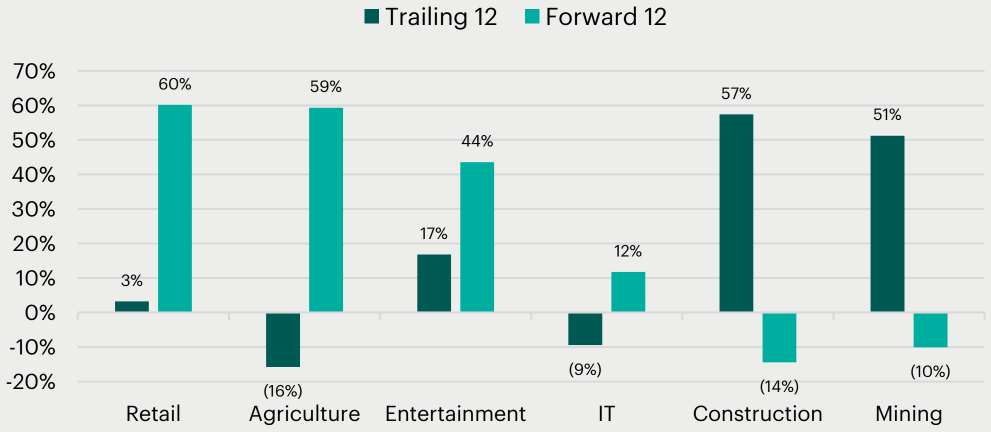


Figure 53:

Best and Worst Industry Performance during 2000 High-Yield Event

Source: Verdad analysis; CRSP/Compustat

Multifactor Model performance

The multifactor model performed quite well during this recession, as evidenced by the high R^2 values for both the 12 month and 24-month period. Value, asset turnover, positive cash flow and net income were all highly predictive, especially during a time period when companies with highly negative cash flows had received very high valuations that ultimately evaporated. Again, companies with lower volume presented greater opportunities for patient investors to capture excess returns.

Figure 54: **Multifactor Model Performance during 2000 High-Yield Event**

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	8.1	0.00	6.9	0.00
Positive NI	0.9	0.37	4.9	0.00
Volume	(8.6)	0.00	(12.1)	0.00
Value Composite	10.2	0.00	10.1	0.00
Positive OCF	0.9	0.35	4.5	0.00
Deleveraging	(0.1)	0.88	(2.0)	0.05
Net Debt / EV	(0.8)	0.43	0.5	0.65
Adjusted R^2	**0.15**		**0.24**	
Degrees of Freedom	**2,833**			

Source: Verdad analysis; CRSP/Compustat

Returns for the market, the value-only portfolio, and the multifactor model are shown in Figure 55. The multifactor model performed exceptionally over the 12- and 24-month periods, although the performance was roughly flat in the second year, with most of the gains being accrued in the first 12 months. Through the height of the 2000s tech euphoria, and during the ensuing panic, investors who relied on empirically proven factors reaped significant returns.

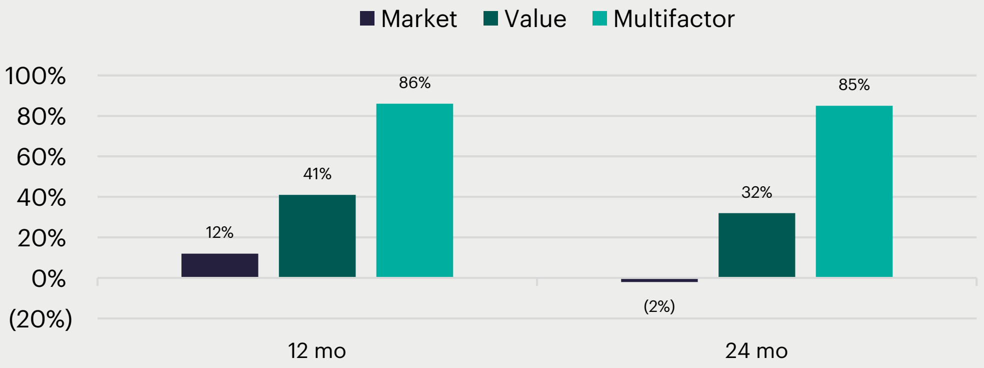


Figure 55:
Portfolio Returns during 2000 High-Yield Event

Source: Verdad analysis; CRSP/Compustat

A sample investment that the Multifactor model would have selected is shown in Figure 56.

Basic Company Info			
Name:	Boyd Gaming Corporation	HQ:	Las Vegas, NV

Description
Operates as a multi-jurisdictional gaming company with 29 properties in Las Vegas and the Midwest and South. It also owns and operates a travel agency. The company was founded in 1973.

Capitalization Info	
Market Cap	214
Net Debt	816
Enterprise Value	1,030
Prior 12-mo mom	(33%)

Financials	
Revenues	987
EBITDA	216
NI	77

Multiples & Ratios	
Asset turnover	0.82
EV/EBITDA	4.8 x
P/B	0.6 x
P/E	2.8 x

Leverage	
Net Debt / EV	0.8 x
Delevering?	Yes

Returns	
12-month return	89%
24-month return	309%

Figure 56:
Illustrative Investment for 2000 Multifactor Model Portfolio

Source: Verdad analysis; CRSP/Compustat

Boyd is a casino and travel agency company founded and headquartered in Las Vegas. As a non-tech company during the 2000 tech boom, Boyd saw its stock unfavored, with a trailing return of -33%. However, the real and healthy cash flows coupled with the attractive valuation ensured that when valuations did reset, Boyd had a backstop of real cash flows to underwrite the valuation. The returns over the next 12- and 24-month periods were stellar.

2008 –
THE GREAT RECESSION

“[Had the British government failed to bail out RBS] there was a grave risk of going from an economic crisis to a political crisis, where you have a breakdown of law and order. We were that close to the brink.”

– Alistair Darling,
Chancellor of the Exchequer (5/28/2018)

“They say not to panic, but the more I’m hearing, the more I’m panicking.”

– Lynn Fenn,
homemaker and Northern Rock depositor
(9/15/2007)

“You just felt like the world was unraveling. People started to sell and they sold hard. It didn’t matter what you had—you sold.”

– Ryan Larson,
senior equity trader, Voyageur Asset
Management (9/30/2008)

Summary

In fall of 2007, Northern Rock, a British bank, failed, causing a run on the bank, the first since 1929, as depositors sought to withdraw their money for fear of the bank going insolvent. Then in October 2008, the Royal Bank of Scotland (RBS), the largest bank in the world at the time, had to be bailed out by the British government. Both calamities are owed to the systematic defaults of US subprime mortgages.

September 15, 2008 was a staggering day for the financial markets. Lehman Brothers went bankrupt, surpassing Enron's record bankruptcy, as the federal government declined its request for loans; Bank of America was pushed by the Fed to acquire Merrill Lynch for $50 billion; the US stock market had its worst one-day loss since the terrorist attacks of September 11, falling 777 points.

The total number of jobs in the US declined by 6.3%, or 8.7 million. The unemployment rate did not recover until 2014, more than 6 years after the recession had concluded, and much slower than the recovery of economic output. The Fed benchmark rate hit 0% on December 16, 2008, from 5.25% in September 2007.

On October 3, President Bush signed the $700 billion Troubled Asset Relief Program (TARP) bailout package. On June 1, 2009, GM filed for bankruptcy. On October 2, 2009, the unemployment rate hit 10%, the highest in 26 years. On August 5, 2011, Standard and Poor's downgraded US government debt to AA+.

As Andrei Schleifer notes in his book, *A Crisis of Beliefs*, the Lehman bankruptcy succeeded in turning the tides of sentiment, even when people had refrained from panic up to that point. The bankruptcy was such a low probability event, it shifted people's expectations to the opposite extreme: pessimism and hysteria.

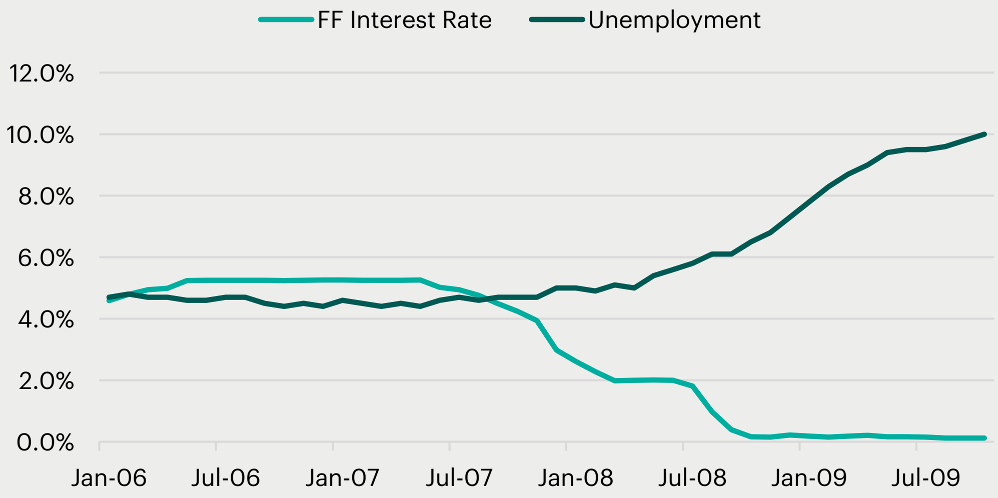


Figure 57:
Federal Funds Rate and Unemployment through 2009

Source: FRED

2008 was unquestionably a unique recession; the level of uncertainty regarding the stability of the financial sector added fuel to the fire and prompted the central bank to aggressively lower rates. Unemployment skyrocketed and the stock market plummeted. Considering the macro conditions, almost all industries performed very poorly in the 12 months leading up to early 2008, and almost all of them performed poorly on the way out as well. It would take longer than 24 months for the aftershocks of the recession to work their way through markets and for confidence to return. Not surprisingly, the industries that performed the worst were those that were highly sensitive to interest rates, namely real estate, mining, and construction.

Multifactor Model performance

Given how unique the 2008 crisis was, the Multifactor model did not perform as well as it did in previous recessions. The lower R^2 value is evidence of this. The results for the factors that had high or low predictive power during this event are shown in Figure 58.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	3.3	0.00	4.1	0.00
Positive NI	11.7	0.00	7.2	0.00
Volume	(1.1)	0.27	0.7	0.45
Value Composite	(5.9)	0.00	(0.5)	0.62
Positive OCF	3.2	0.00	3.7	0.00
Deleveraging	4.0	0.00	2.2	0.03
Net Debt / EV	(4.5)	0.00	(1.8)	0.07
Adjusted R^2	**0.08**		**0.06**	
Degrees of Freedom	**2,925**			

Figure 58:
Multifactor Model Performance during 2008 High-Yield Event

Source: Verdad analysis; CRSP/Compustat

Interestingly, the strongest predictive variables were Positive Net Income, high Asset Turnover, and Positive Operating Cash Flow. Value had little predictive power, and Volume was not particularly important. However, deleveraging was very important, and businesses with higher levels of debt performed very poorly. Given that we know leverage increases the disparity of outcomes, and that 2008 was such a severe recession, it should not be a surprise that more highly levered companies did poorly.

Returns for the market, the value-only portfolio, and the multifactor model are shown in Figure 59. The Multifactor model was the worst performing by a small margin over the 12-month period, but vastly outperformed over a 24-month period. As mentioned above, this is likely because the repercussions from 2008 took longer than 12 months to work their way through the markets.

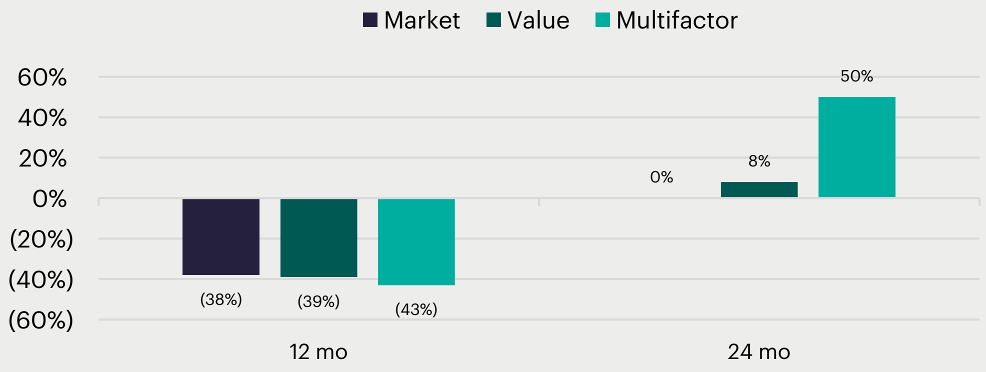


Figure 59:
Portfolio Returns during 2008 High-Yield Event

Source: Verdad analysis; CRSP/Compustat

A sample investment that the Multifactor model would have selected is shown in Figure 60.

Basic Company Info			
Name:	Westlake Chemical Corporation	HQ:	Houston, TX

Description
Manufactures and markets basic chemicals, vinyls, polymers, and building products worldwide. WLK's customers include chemical processors, plastics fabricators, and construction contractors.

Capitalization Info	
Market Cap	857
Net Debt	487
Enterprise Value	1,343
Prior 12-mo mom	(40%)

Financials	
Revenues	3,388
EBITDA	260
NI	115

Multiples & Ratios	
Asset turnover	1.37
EV/EBITDA	5.2 x
P/B	0.7 x
P/E	7.5 x

Leverage	
Net Debt / EV	0.4 x
Delevering?	Yes

Returns	
12-month return	13%
24-month return	102%

Figure 60:
Illustrative Investment for 2008 Multifactor Model Portfolio

Source: Verdad analysis; CRSP/Compustat

Westlake Chemical Corp is a company that exhibits some of the characteristics that performed well during the 2008 period and was a high-ranking pick for the Multifactor model. With high Asset Turnover, strong net income and free cash flow, the company was moderately levered and could survive and de-lever during the crisis. While returns after 12 months were not particularly impressive, over 24 months they were quite attractive.

2010 –
TOO EU TO FAIL

"There is a recognition that the Greek crisis has morphed into not only a European crisis but is going global."

– Mohamed A. El-Erian,
CEO of Pimco (5/6/2010)

"It's not that the market is testing one country—it's very anxious about the sustainability of debt in general."

– Luke Spajic,
head of European credit at Pimco (5/6/2010)

Summary

This high-yield spread dislocation was caused by the European sovereign debt crisis, which found its origins in the 2008 housing crisis. Many sovereigns took on more debt than they could handle from the insolvent financial institutions that had suffered enormous losses in the subprime mortgage crisis. In Ireland, debts throughout the banking system added up to eight times the government's tax revenue. Conditions were similar in both Greece and Iceland. This time, instead of individual banks going bankrupt, entire countries went broke.

Greece itself dragged down its banking system, independently of the US housing bubble. Investment bankers helped it disguise its dire financial condition to get admitted into the European Union, where it could borrow large amounts of money at low rates with Germany as its underwriter. So, Greece could double the public sector wages they were paying within ten years and keep a railroad company going that was paying 400 million euros in salaries on a 100-million-euro revenue base.

Despite differing fiscal policies and authorities, all of Europe was necessarily involved because of its shared currency. European banks often hold individual countries' sovereign debt, further reinforcing these ties. The shared currency proved another obstacle, preventing struggling countries from devaluing their currency to increase exports and stimulate their economies.

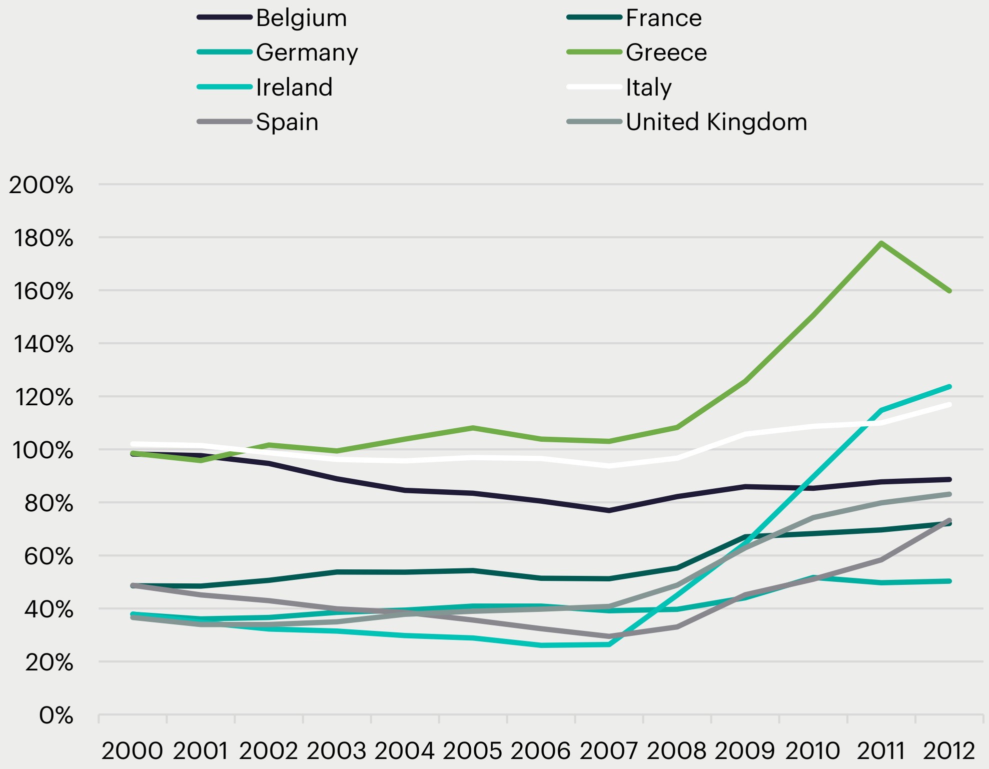


Figure 61:

Debt as % of GDP for Selected European Countries

Source:
IMF Public Debt Database

The levels of leverage that some of the European countries were achieving put them in a precarious position and caused considerable investor concern. As debt as a percentage of GDP rose, yields rose, making rolling over the debt more expensive, and stock market valuations for much of the Eurozone plummeted, with some contagion in the United States. However, the contagion was largely limited to companies with European exposure, and as a result, most industries in the US performed relatively well over the following 12 months, as shown in Figure 62.

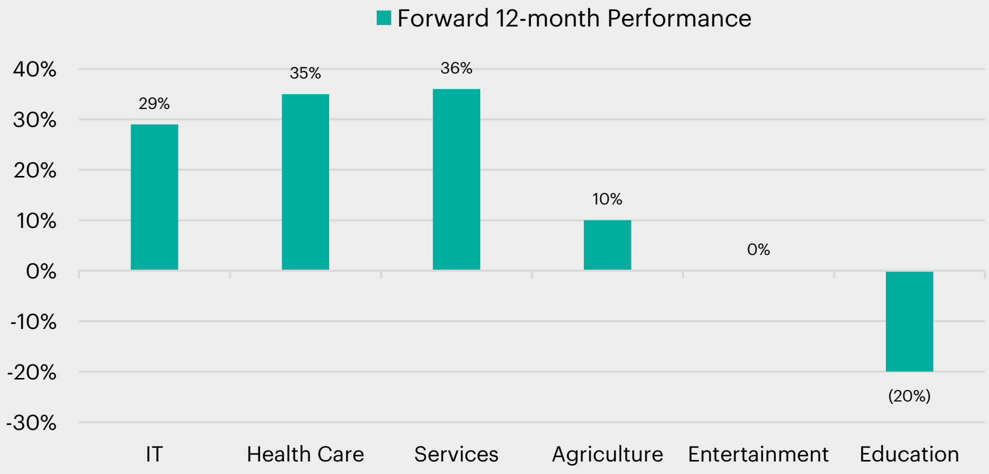


Figure 62:
Best and Worst Industry Performance during 2010 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Multifactor Model performance

Largely, the multifactor model did not perform well in the US during the 2010 high-yield event. This is likely because most of the opportunities were in Europe and the multifactor model was restricted to investing in the US. The variables that were most predictive were positive operating cash flow and net income, while value performed poorly.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	(0.5)	0.62	1.7	0.08
Positive NI	4.2	0.00	7.1	0.00
Volume	(3.4)	0.00	(5.6)	0.00
Value Composite	(4.2)	0.00	(3.7)	0.00
Positive OCF	7.9	0.00	9.1	0.00
Deleveraging	0.6	0.53	1.3	0.20
Net Debt / EV	(1.0)	0.30	(1.0)	0.32
Adjusted R^2	**0.04**		**0.08**	
Degrees of Freedom	**2,817**			

Figure 63:
Multifactor Model Performance During 2010 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

Growth companies tended to perform better during this time period, as value was somewhat out of favor, which is evident by its poor performance as a predictive variable. Additionally, companies with higher levels of leverage tended to perform worse.

Returns for the market, the value-only portfolio, and the multifactor model are shown in Figure 64.

The multifactor model was the worst performing over both the 12- and 24-month periods. Given how heavily the model favors value companies, it should come as no surprise that if value did poorly, then the multifactor model also did poorly. Over the 24-month period, the multifactor model's preference for companies with some leverage on the balance sheet appears to have hurt the performance relative to pure value.

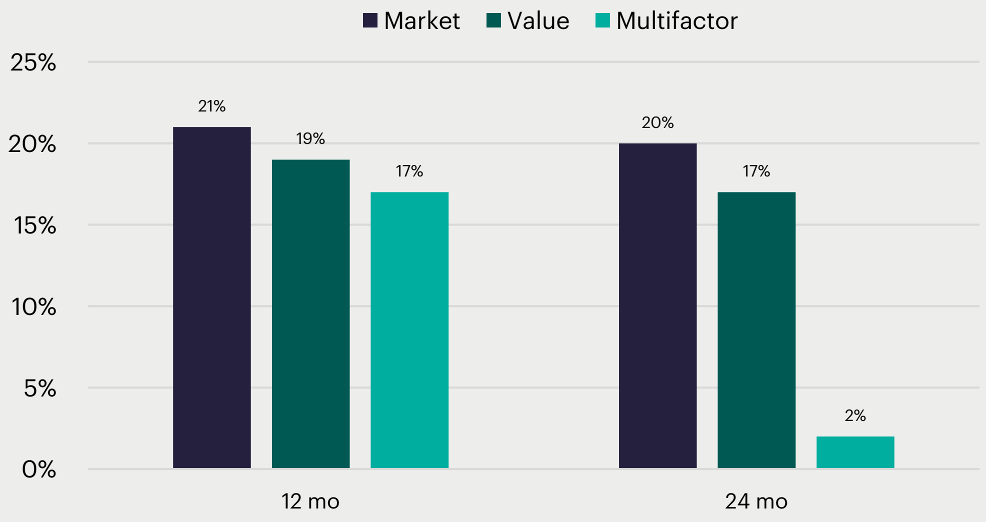


Figure 64:
Portfolio Returns during 2010 High-Yield Event

Source:
Verdad analysis;
CRSP/Compustat

A sample investment that the multifactor model would have selected is shown below.

Basic Company Info			
Name:	Multi-Color Corporation	HQ:	Cincinnati, OH

Description
Manufactures label solutions in the US, Belgium, Germany, and internationally. The company manufactures labels, as well as scratch-off coupons, static-clings, and roll-fed labels. It also provides shrink sleeve and aluminum labels.

Capitalization Info	
Market Cap	155
Net Debt	83
Enterprise Value	237
Prior 12-mo mom	3%

Financials	
Revenues	277
EBITDA	38
NI	13

Multiples & Ratios	
Asset turnover	1.00
EV/EBITDA	6.2 x
P/B	1.1 x
P/E	12.4 x

Leverage	
Net Debt / EV	0.3 x
Delevering?	Yes

Returns	
12-month return	67%
24-month return	74%

Figure 65:
Illustrative Investment for 2010 Multifactor Model Portfolio

Source: Verdad analysis; CRSP/Compustat

Multi-Color Corp is a company that would have performed very well in the 2010 Multifactor model. Given the exposure to Europe, it was relatively cheap and would have been a victim of the European wide sell off. With lower debt levels and healthy free cash flows, it was able to service the debt and accrete value to shareholders. If the multifactor model had been run in Europe during this high-yield event, it would have been very likely that we would have seen many more companies like Multi-Color Corp, and the model would have exhibited stronger performance.

2012 –
A SLOW RECOVERY

"There is a very severe risk of a banking collapse across all of Europe."

– Barry Eichengreen,
professor of economics at University
of California, Berkeley (5/22/2012)

"The lesson is, it's time to go your own way. The euro has failed. It's over."

– Simon Johnson,
professor of economics at MIT (5/22/2012)

Summary

After a central bank-stimulated recovery from the Great Recession, the US almost slid back to recession again in 2012. Worldwide, it took much longer than anyone expected to recover from the 2008-2009 recession, and 2012 served as a bottom for many countries' economic conditions. In the US, the 2012 presidential election gave a substantial slowdown to the economy as early as May. Corporations held back their investments until they knew the presidential implications for tax codes and the upcoming fiscal cliff—including five tax increases and two fiscal cuts that were to go into effect on January 1, 2013. It is estimated that without intervention, the fiscal cliff would have contracted GDP by 1.3%, pushing the economy right back into the Great Recession.

The presidential candidates had differing approaches to dealing with this upcoming deadline: Obama favored allowing the wealthy to bear the burden of the tax increases, while Romney preferred to keep taxes unchanged and instead cut defense spending. At the time, Goldman Sachs CEO Lloyd Blankfein pointed out the $1 trillion in cash being held by non-financial corporations in anticipation of the election.

Meanwhile, Europe's condition was only a continuation of the problems from the European debt crisis of 2010. Near the end of 2012, the Eurozone fell back into a "double-dip" recession. Several European companies were in worse condition than even during the Great Recession. Spain required a bailout, joining the company of Portugal, Greece, Iceland, and Ireland. In 2009, Greece contracted by 0.5%, but by as much as 5.4% in 2011 and 5.2% in 2012. It was reclassified as an emerging market in 2013. In 2009, Portugal shrank 2%, while in 2012, 3%. The U.K. experienced renewed recession, as it endured GDP contractions for two quarters in 2012.

There was also weakness in growth in both India and China. India had to cut its 2012 growth estimates in half due to a nasty combination of inflation, interest rates, and a political crisis. China had lower growth than even in the Great Recession as it cut back in attempts to stop the inflation it had caused by its economic stimulus.

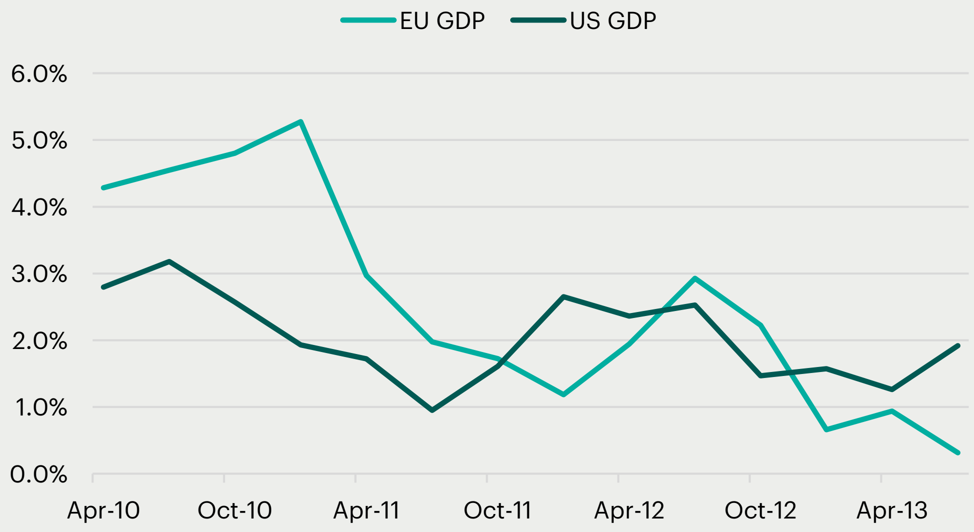


Figure 66:
US and EU GDP Growth through 2013

Source:
FRED

As seen in Figure 66, recovery from the 2008 recession and the 2010 EU crisis were slow in both the US and the EU. After briefly recovering, GDP growth slowed considerably and caused investors to wonder whether we were bottoming out again. A highly accommodative stance by the Fed ensured that consumer confidence remained relatively high, reflected in the performance of discretionary sectors like food services and entertainment. IT also led the way with the strong growth that buoyed much of the US economy during this period.

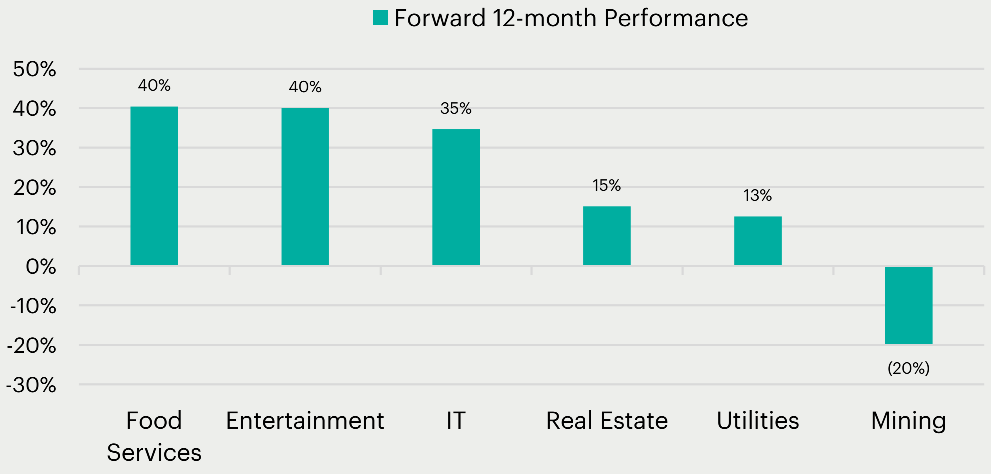


Figure 67:
Best and Worst Industry Performance during 2012 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

Multifactor Model Performance

The model had relatively low predictive power during 2012 as measured by the adjusted R^2 value, however the variables that had predictive power in previous recessions worked well here. Companies with higher levels of asset turnover, higher value scores, positive operating cash flow, and that were deleveraging did quite well.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	3.6	0.00	1.1	0.26
Positive NI	0.1	0.91	1.4	0.15
Volume	(0.9)	0.39	(1.7)	0.09
Value Composite	3.8	0.00	3.5	0.00
Positive OCF	2.3	0.02	4.1	0.00
Deleveraging	1.7	0.08	1.5	0.13
Net Debt / EV	0.1	0.93	0.8	0.42
Adjusted R^2	**0.02**		**0.03**	
Degrees of Freedom	**2,679**			

Figure 68:
Multifactor Model Performance during 2012 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

Returns for the market, the value-only portfolio, and the multifactor model are shown below. Although the model had lower predictive power for predicting returns for all companies in the market, it did exceptionally well at selecting companies that had the highest performance during this time period. The multifactor model returned almost 3x the market over 12 months, and 2x the value portfolio over 12 months, with an exceptional 122% return over the 24-month period.

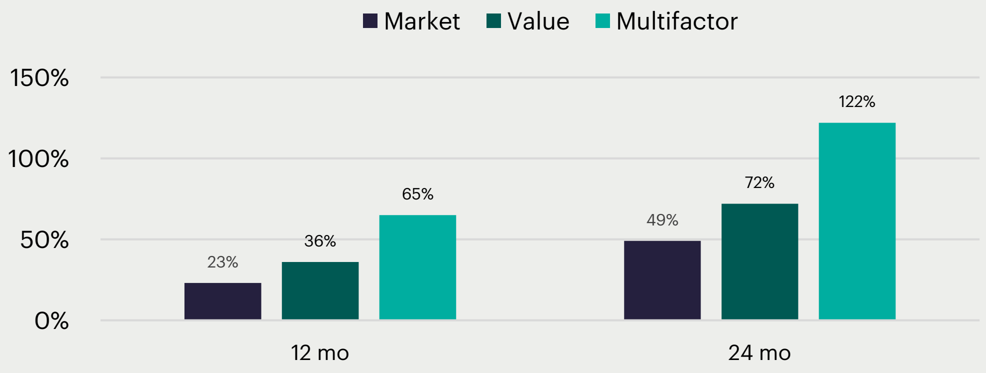


Figure 69:
Portfolio Returns during 2012 High-Yield Event

Source: Verdad analysis; CRSP/Compustat

A sample investment that the multifactor model would have selected is shown below.

Basic Company Info			
Name:	Tower International, Inc.	HQ:	Livonia, MI

Description
Manufactures and sells engineered automotive structural metal components and assemblies primarily for OEMs in the US and Brazil. They provide body structures and assemblies for body pillars, hoods, doors, and fenders.

Capitalization Info	
Market Cap	152
Net Debt	503
Enterprise Value	655
Prior 12-mo mom	(38%)

Financials	
Revenues	1,936
EBITDA	197
NI	10

Multiples & Ratios	
Asset turnover	1.56
EV/EBITDA	3.3 x
P/B	3.5 x
P/E	15.1 x

Leverage	
Net Debt / EV	0.8 x
Delevering?	Yes

Returns	
12-month return	172%
24-month return	345%

Figure 70:
Illustrative Investment for 2012 Multifactor Model Portfolio

Source: Verdad analysis; CRSP/Compustat

Tower International is a great example of a company that was in a secular part of the economy and was out of favor with investors during the turbulence of 2012. Having drawn down over 35% in the prior 12 months, it was trading cheaply by value metrics, and had healthy cash flows to pay down the substantial debt levels. By deleveraging and de-risking, the company was able to generate significant returns for shareholders: of 172% over 12 months and 345% over 24 months.

2015 –
OIL COLLAPSE ROUND 2

On the firing of junk bond fund Third Avenue's CEO after being down 27% for 2015: "The move roiled credit markets Friday and sparked widespread concern about other mutual funds with large holdings of corporate junk bonds. The largest U.S. junk-bond exchange-traded fund closed at its lowest level since 2009 Friday on record trading volume."

– Wall Street Journal (12/14/2015)

"It varies week to week, but every week keeps getting worse. We don't know where the bottom is, but we're not there yet."

– Marcus Jundt,
restaurant owner in oil town Williston, ND
(3/11/2016)

Summary

This crisis closely resembles the 1986 oil-price collapse, when Saudi Arabia started a race to the bottom in order to maintain its market share in the energy industry. Likewise, in 2014 the Organization of the Petroleum Exporting Countries (OPEC) was being pressured by other producers entering the market at peak prices, especially the inflows from US shale oil and Canadian oil sands. It forecasted that production by non-OPEC oil producers in 2015 would grow more than demand, and OPEC did not want to lose market share.

In November, the cartel convened in Vienna, where Saudi Arabia convinced the other members not to prop up oil prices with production limits. While most OPEC countries needed the price of oil to be higher in order to balance their national budgets, Saudi Arabia was financially more secure, and could withstand low oil prices for a while, in the time that other producers would be driven out of the market. Following this cartel decision, the price of a barrel of oil fell from $72 to nearly $36 in late 2015.

The strength of the dollar played another key role in the oil crisis. As the Fed brought interest rates up from their ultra-easy monetary policy, foreign investors flocked to the dollar, making it stronger. In April, the dollar was at a 12 year high against the euro.

The strengthening of the dollar caused a weakening of demand for oil. As the dollar was stronger, players in emerging markets had a harder time paying their dollar-denominated debt. A strong dollar put additional pressure on China, which had long pegged its currency to the U.S. currency. China, the world's largest importer of oil, had the worst year for its economy in 25 years, growing only 1%. Beijing revealed its lack of confidence for the Chinese economy when the government devalued the yen by 4% in August.

To compound the problem, the U.S. signed a nuclear deal with Iran, lifting tariffs and thus allowing $40 billion more in Iranian oil to flood the market.

In response to lower prices, oil producers decommissioned half their rigs, and ceased exploration and production, while still stuck with large amounts of debt. As energy investment shrunk, so did all the firms manufacturing energy equipment.

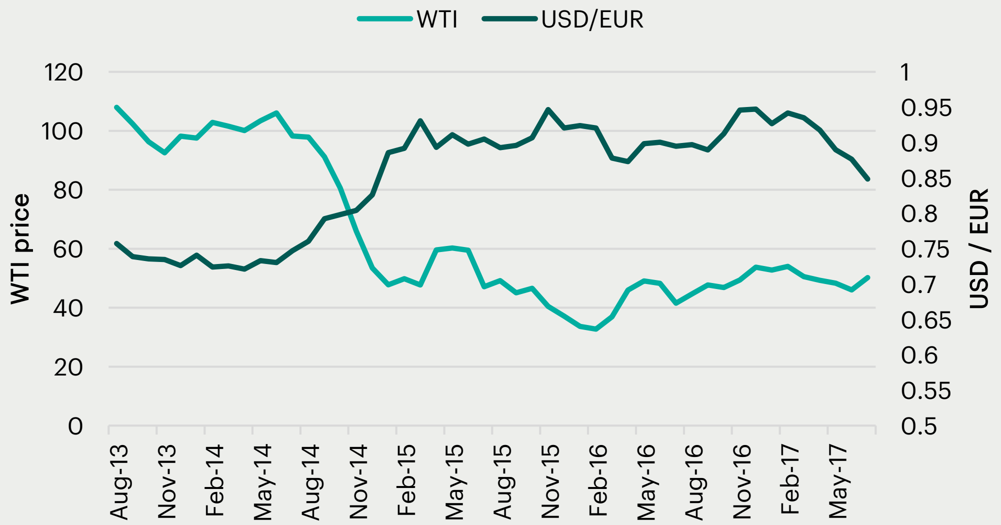


Figure 71:
WTI Prices and USD/EUR Aug. 2013 - July 2017

Source:
FRED; CapitalIQ

As shown in Figure 71, the price of oil dropped precipitously during late 2014, from ~$110 to ~$50, wreaking havoc amongst the newly emerged shale industry companies, as well as traditional energy companies. Additionally, the strengthening of the dollar caused US companies to be weaker exporters, and for a country still recovering from the hangover of the Great Financial Crisis, this added more uncertainty. There was considerable mean reversion in industry performance during the 2015 high-yield event, with the worst performing prior industries performing very well coming out of the event, notably mining, education, and construction.

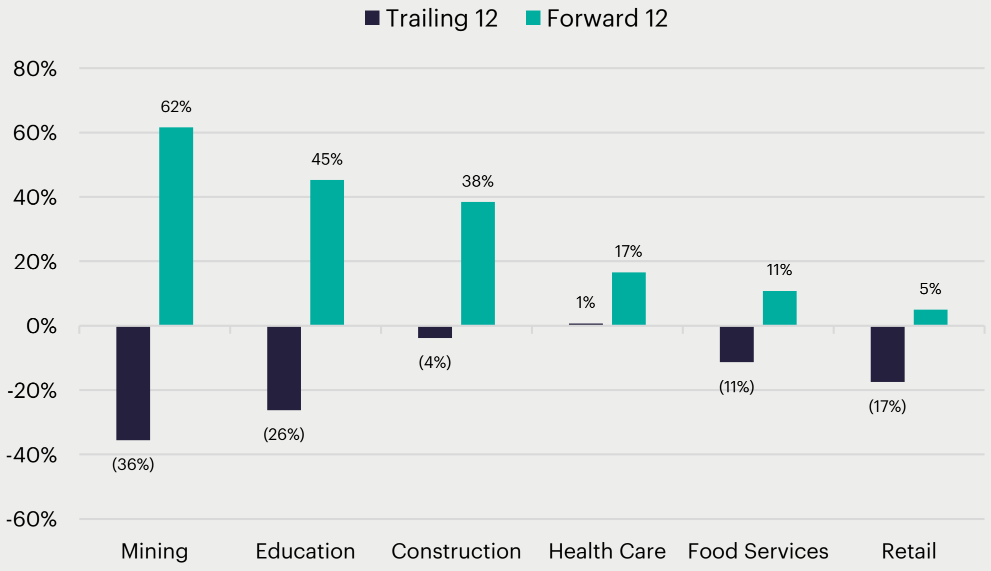


Figure 72:
Best and Worst Industry Performance during 2015 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

Multifactor Model performance

The multifactor model performed relatively well during this period, with value and positive operating cash flow being two of the most important variables over the 12-month period. Over the 24-month period, the predictive variables had less power, and the model was less accurate in predicting overall returns.

	12-month Return		24-month Return	
Variable	**t value**	**P value**	**t value**	**P value**
Asset Turnover	(2.3)	0.02	0.9	0.38
Positive NI	(3.8)	0.00	1.4	0.18
Volume	0.5	0.63	(0.1)	0.90
Value Composite	5.8	0.00	0.6	0.54
Positive OCF	5.9	0.00	5.2	0.00
Deleveraging	(1.0)	0.33	0.6	0.55
Net Debt / EV	0.1	0.89	(0.7)	0.47
Adjusted R²	**0.04**		**0.02**	
Degrees of Freedom	**2,773**			

Figure 73:
Multifactor Model Performance during 2015 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

Despite the lower overall predictive power, the model performed quite well in constructing a portfolio of 50 stocks that scored highly according to the above criteria. Returns for the market, the value-only portfolio, and the multifactor model are shown in Figure 74. Over the 12-month and 24-month periods, the multifactor model was the best performing portfolio, and performed considerably better over the 24-month period.

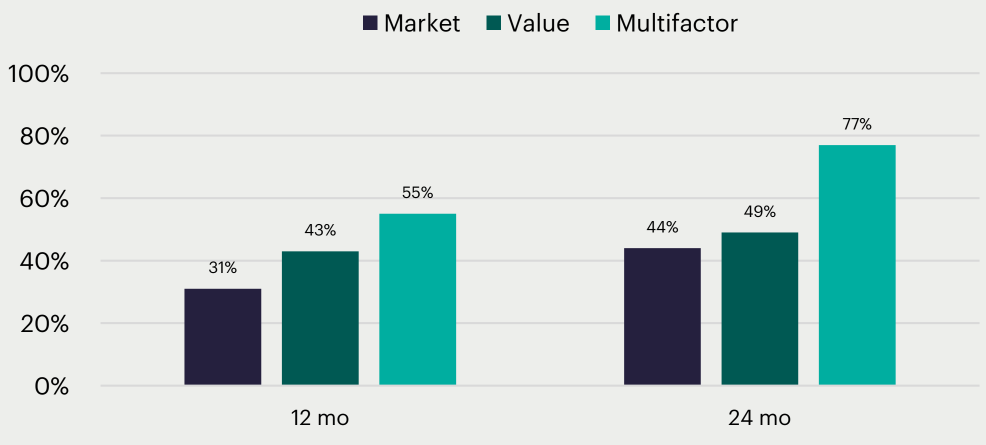


Figure 74:
Portfolio Returns during 2015 High-Yield Event

Source:
Verdad analysis; CRSP/Compustat

A sample investment that the multifactor model would have selected is shown in Figure 75.

Figure 75:

Illustrative Investment for 2015 Multifactor Model Portfolio

Basic Company Info			
Name:	Hi-Crush Inc.	HQ:	Houston, TX

Description
Provides proppant and logistics solutions to the petroleum industry in North America. The company offers raw frac sand used in hydraulic fracturing process for oil and natural gas wells. It owns and operates frac sand mining facilities.

Capitalization Info	
Market Cap	145
Net Debt	244
Enterprise Value	389
Prior 12-mo mom	(83%)

Financials	
Revenues	340
EBITDA	58
NI	26

Multiples & Ratios	
Asset turnover	0.77
EV/EBITDA	6.7 x
P/B	1.1 x
P/E	5.6 x

Leverage	
Net Debt / EV	0.6 x
Delevering?	Yes

Returns	
12-month return	339%
24-month return	209%

Source:
Verdad analysis;
CRSP/Compustat

Hi-Crush is a company that would have been squarely in the middle of the fracking boom and bust cycles. As OPEC turned on the pumps and lowered the price of oil, Hi-Crush saw its stock price seriously fall. With leverage on the balance sheet and commodity driven cash flows, many investors were running away from fracking stocks like Hi-Crush. However, by taking advantage of other investors fears, investors would have been rewarded with over 300% returns over the next 12 months.

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