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INVESTMENT MANAGEMENT

Counterpoint Global Insights

Drawdowns and Recoveries

Base Rates for Bottoms and Bounces

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Introduction

One of the hardest aspects of being a long-term investor is that even the best investments, or investment portfolios, suffer large drawdowns. A drawdown is the price decline from peak to trough.

Charlie Munger, the former vice chairman at Berkshire Hathaway, has a take on drawdowns worth quoting in detail:

"I think it's in the nature of long-term shareholding with the normal vicissitudes in worldly outcomes and in markets that the long-term holder has his quoted value of his stock go down by say 50 percent. In fact, you can argue that if you're not willing to react with equanimity to a market price decline of 50 percent 2 or 3 times a century, you're not fit to be a common shareholder and you deserve the mediocre result you are going to get—compared to the people who do have the temperament who can be more philosophical about these market fluctuations."[1]

Munger not only argues that you have to be calm about these declines, he goes further to suggest that if you cannot deal with them "you deserve the mediocre result you are going to get." In other words, big drawdowns are a price to pay for superior long-term investment returns.

The partnership that Munger managed produced a compound annual growth rate of 19.8 percent from 1962 to 1975, but it suffered a 53.4 percent drawdown in the 2 years ended in 1974.[2]

Long-term wealth creation for companies is also heavily skewed. Hendrik Bessembinder, a professor of finance at Arizona State University, studied the roughly 28,600 public companies that have been listed in the U.S. from 1926 to 2024. Key to his definition of wealth creation is that a stock produce returns in excess of one-month Treasury bills.

AUTHORS

Michael J. Mauboussin
michael.mauboussin@morganstanley.com

Dan Callahan, CFA
dan.callahan1@morganstanley.com

His data show that just under 60 percent of the sample failed to match the returns of Treasury bills, destroying $10.1 trillion in value through December 2024. The other 40 percent or so created $89.5 trillion in value. Just 2 percent of the companies produced 90 percent of the aggregate wealth creation of $79.4 trillion, and the top 6 (Apple, Microsoft, NVIDIA, Alphabet, Amazon, and ExxonMobil) alone added $17.1 trillion.[3]

Had you been astute enough to buy and hold any of these super wealth creators you would have suffered meaningful drawdowns. For example, the lifetime wealth creation of Amazon, a technology company known for e-commerce and cloud computing, was $2.1 trillion from its initial public offering in 1997 to year-end 2024. Yet Amazon shares dropped 95 percent from December 1999 to October 2001. The average maximum drawdown for the stocks of the top 6 companies was 80.3 percent, similar to the average of the full sample.

This report investigates drawdowns for stocks and mutual funds. The findings are provocative and surprising, but this research has some inherent limitations. First, since our goal is to analyze what happens to companies following their maximum drawdowns, we limit the sample to companies that continued to trade after the drawdown. We therefore exclude companies that were delisted either for cause or bankruptcy, which typically results in drawdowns of 100 percent.

Further, we excluded stocks that failed get to a market capitalization of $1 million (adjusted for inflation) by the end of any month, essentially a non-investable universe, as well as American Depositary Receipts (ADRs), which represent the securities of foreign companies.

Second, this work is explicitly based on hindsight. We know what drawdowns and recoveries look like in the past. But if you own a stock in decline, you have no way of knowing the price at which it will trough. Recoveries are equally tricky. All great stocks rebounded from the bottom, but not all rebounds from the bottom are great stocks.

Still, studying drawdowns provides us with useful context to understand equity markets in general and the returns of individual stocks in particular. In this report, we review overall base rates, point out that painful drawdowns exist even in a world with perfect foresight into long-term returns, provide two case studies, review relevant academic research, and offer some qualitative guidelines for considering which stocks may bounce off the bottom.

Overall Base Rates

Let's start with the overall data. Exhibit 1 shows the maximum drawdown and recovery results for the stocks of more than 6,500 companies from 1985 to 2024. We calculate the drawdowns using price changes rather than total returns. The median drawdown was 85 percent and the time from peak to trough was 2.5 years. The average drawdown was a little lower, 81 percent, and took 3.9 years.[4]

Exhibit 1: Maximum Drawdowns and Recoveries for U.S. Stocks, 1985-2024

	Max Drawdown	Max Drawdown Duration (Years)	Peak Recovery from Max Drawdown (Percent of Par)	Time Back to Par (Years)
Median	-85.4%	2.5	89.6%	2.5
Average	-80.7%	3.9	338.5%	3.8

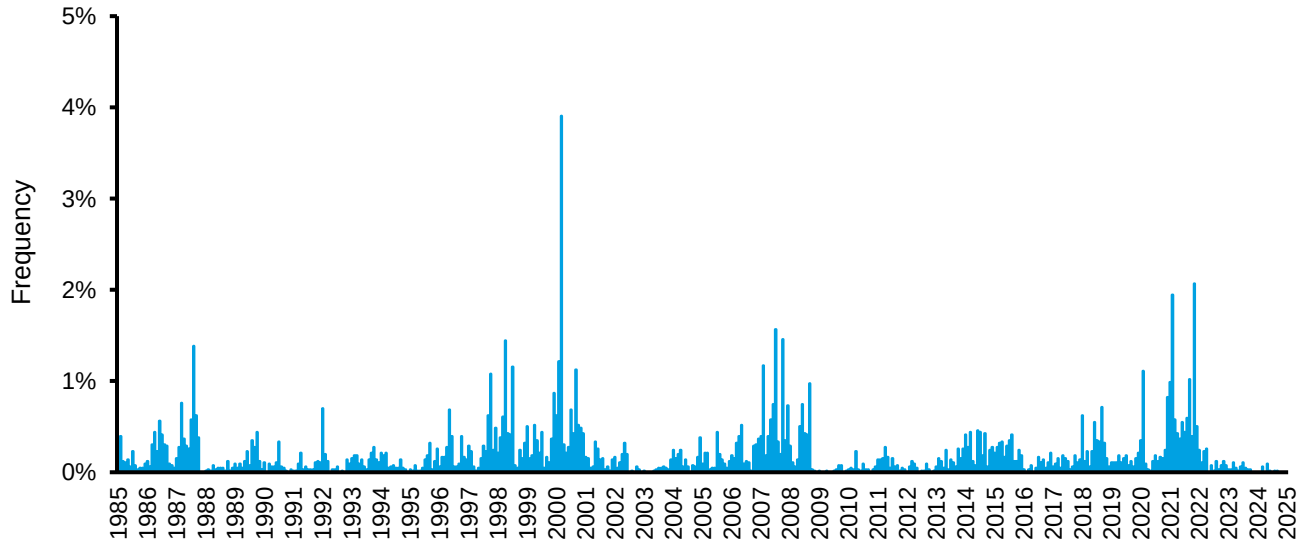
Source: Counterpoint Global and FactSet.
Note: Par=Prior high (starting point of max drawdown); Reflects intraday prices; Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month.

The median stock's recovery from its maximum drawdown is 90 percent of the prior peak price (par), which means it fails to return to its past high. In fact, about 54 percent of stocks never return to par after hitting bottom. The median time to go from trough to par, 2.5 years, is the same as it took to go from peak to trough.

The average recovery, at nearly 340 percent of par, is a lot higher than the median recovery because of the skewness in the data. This tells you that some stocks produced very high returns off of the bottom. As with the medians, the time it takes to drop from peak to trough is roughly the same as it takes to recover.

Exhibit 2 shows the frequency of when stocks peaked, marking the beginning dates of drawdowns. These bursts coincide with stock market peaks, including the dot-com boom (2000), the period preceding the global financial crisis (2007-2008), and the COVID bounce-back (2021).

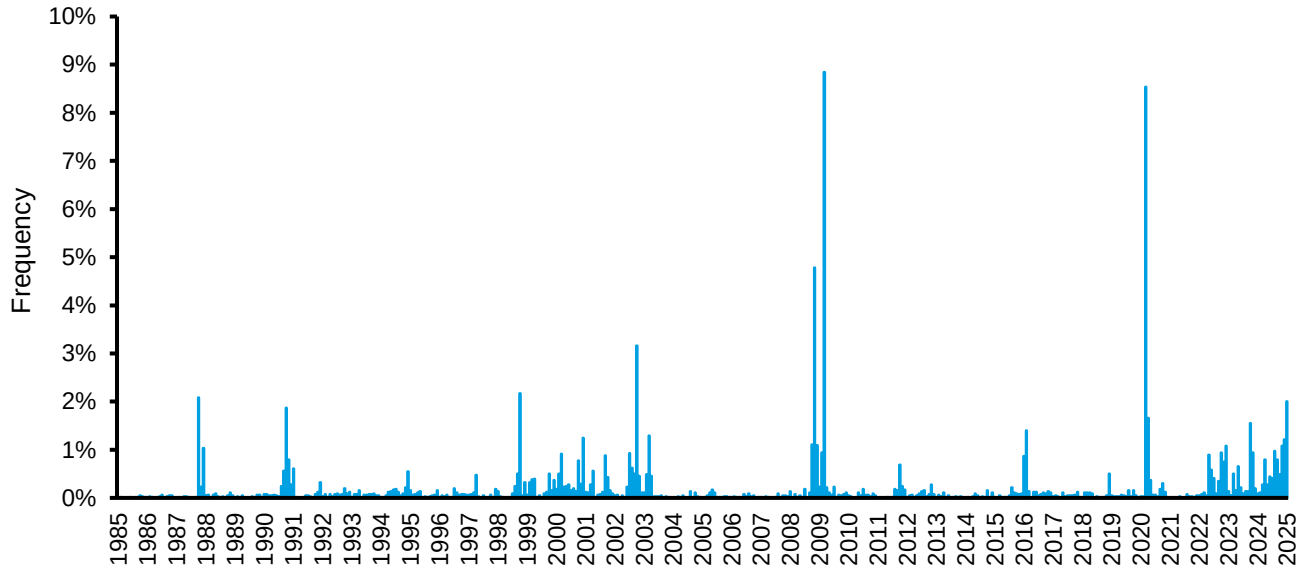
Exhibit 2: Frequency of Beginning Dates for Maximum Drawdowns, Monthly, 1985-2024



Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month.

Stocks generally trough in environments of poor market returns. Exhibit 3 reveals the frequency of when stocks hit bottom. Spikes of high frequency happen during the dot-com bust (2003), the global financial crisis (2009), and the market shock from COVID (2020).

Exhibit 3: Frequency of Ending Dates for Maximum Drawdowns, Monthly, 1985-2024



Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month.

Exhibit 4 presents maximum drawdowns of various magnitudes, including the average duration of the time from peak to trough, the median magnitude of the peak recovery as a percent of the par, the percent of stocks in the drawdown bin that get back to par, and how long it took the stocks that returned to par to do so.

Exhibit 4: Base Rates for Drawdown Duration and Recoveries By Max Drawdown, 1985-2024

Max Drawdown	Max Drawdown Duration, Average (Years)	Peak Recovery from Max Drawdown As a Percent of Par, Median	Percent That Get Back to Par	Time Back to Par, Average (Years)	Count
95-100%	6.7	16%	16%	8.0	1,842
90-95%	4.3	65%	37%	5.8	830
85-90%	3.7	78%	42%	4.6	678
80-85%	3.2	100%	49%	4.2	584
75-80%	3.1	122%	54%	3.8	501
70-75%	2.5	131%	62%	3.4	456
65-70%	2.3	134%	67%	3.2	394
60-65%	1.9	149%	67%	2.5	325
55-60%	1.7	147%	74%	2.2	276
50-55%	1.4	150%	77%	2.0	241
0-50%	1.0	146%	80%	1.5	455

Source: Counterpoint Global and FactSet.
Note: Par=Prior high (starting point of max drawdown); Reflects intraday prices; Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month.

This exhibit reveals a number of useful facts about the drawdown data in the last 40 years. First, maximum drawdowns of 95-100 percent make up 28 percent of the sample and, in general, the smaller the drawdown the fewer the stocks within that cohort.

There is a close relationship between the magnitude of the maximum drawdown and how long it takes a stock price to go from peak to trough. Drawdowns of 95-100 percent take 6.7 years, on average, while those of 0-50 percent take only 1 year. For the stocks that get back to par, the further they fall the longer it takes to get back to the prior peak: 8.0 years, on average, for the 95-100 percent cohort versus just 1.5 years for the 0-50 percent cohort.

The data also reveal that the further a stock falls from its peak, the lower its probability of ever again attaining its past apex. Only about one in six stocks that decline 95-100 percent ever get back to their prior peak, while four in five in the 0-50 percent drawdown group do so.

Analysis of the peak recovery from maximum drawdown, expressed as a percent of par, shows that a majority of companies that have drawdowns of 80 percent or more never get back to par. But note that the percentage recoveries off of the lows can be spectacular.

For example, assume a stock peaked at $100 and draws down 77.5 percent (mid-range of the 75-80 percent bin), to $22.50. If the stock recovers to the median of that cohort, 122 percent of par, the stock would be up 5.4 times ($122 ÷ $22.50 = 5.4). A stock that peaks at $100 and draws down 97.5 percent (mid-range of the 95-100 percent bin) would go to $2.50. A bounce to 16 percent of par would be 6.4 times the low ($16 ÷ $2.50 = 6.4). The unrealistic assumption is the ability to buy at the bottom.

To make this point more vivid, exhibit 5 shows the median compound annual growth rate (CAGR) in total shareholder returns (TSR) in the 1, 3, 5, and 10 years that follow a stock reaching its maximum drawdown.

The results broadly reveal that the larger the percentage drop in a stock, the greater the percentage bounce. The median CAGR in TSR for the five and ten years following a stock's nadir is roughly twice as high for the largest drawdown bin (95-100 percent) as it is for the smallest bin (0-50 percent).

Exhibit 5: Base Rates of Returns By Magnitude of Maximum Drawdown, 1985-2024

Maximum Drawdown	Median Total Shareholder Returns, Annualized			
	1 Year	3 Years	5 Years	10 Years
95-100%	294.7%	85.0%	54.9%	32.6%
90-95%	200.3%	68.2%	46.6%	29.1%
85-90%	143.3%	55.2%	37.9%	25.8%
80-85%	130.8%	53.8%	38.1%	26.0%
75-80%	112.8%	48.8%	35.2%	24.2%
70-75%	100.9%	39.8%	29.1%	21.0%
65-70%	89.4%	36.1%	27.8%	20.0%
60-65%	78.6%	37.1%	27.5%	21.5%
55-60%	73.1%	34.8%	24.9%	19.7%
50-55%	65.0%	31.8%	24.3%	19.6%
0-50%	47.1%	29.8%	23.3%	19.0%

Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month; Reflects intraday prices.

But it is essential to remember the math of compounding. For instance, a $100 stock that has a CAGR of negative 50 percent for 5 years will drop to $3.13. If the same stock enjoys a CAGR of positive 50 percent in the next 5 years, it will rise to $23.73. This is an impressive rise off of the bottom but a far cry from the starting price of $100.

Empirically, stocks that go down the most are riskier, on average, than those that drop a lesser amount. Exhibit 6 reflects abnormal returns, which is the actual return of a stock minus its expected return.[5] The abnormal returns in exhibit 6 are lower than the actual returns in exhibit 5 but follow a similar pattern.

Exhibit 6: Base Rates of Abnormal Returns By Level of Maximum Drawdown, 1985-2024

Maximum Drawdown	Median Abnormal Returns, Annualized			
	1 Year	3 Years	5 Years	10 Years
95-100%	233.8%	52.3%	25.3%	18.9%
90-95%	149.8%	39.7%	22.6%	15.7%
85-90%	95.0%	29.7%	14.9%	12.8%
80-85%	85.1%	27.3%	16.8%	13.1%
75-80%	67.6%	26.6%	13.1%	12.0%
70-75%	58.1%	19.3%	12.6%	11.2%
65-70%	53.1%	18.7%	10.7%	10.6%
60-65%	48.5%	20.0%	11.6%	11.4%
55-60%	40.3%	21.1%	12.6%	9.8%
50-55%	36.1%	17.4%	13.5%	13.8%
0-50%	30.0%	19.1%	13.9%	10.4%

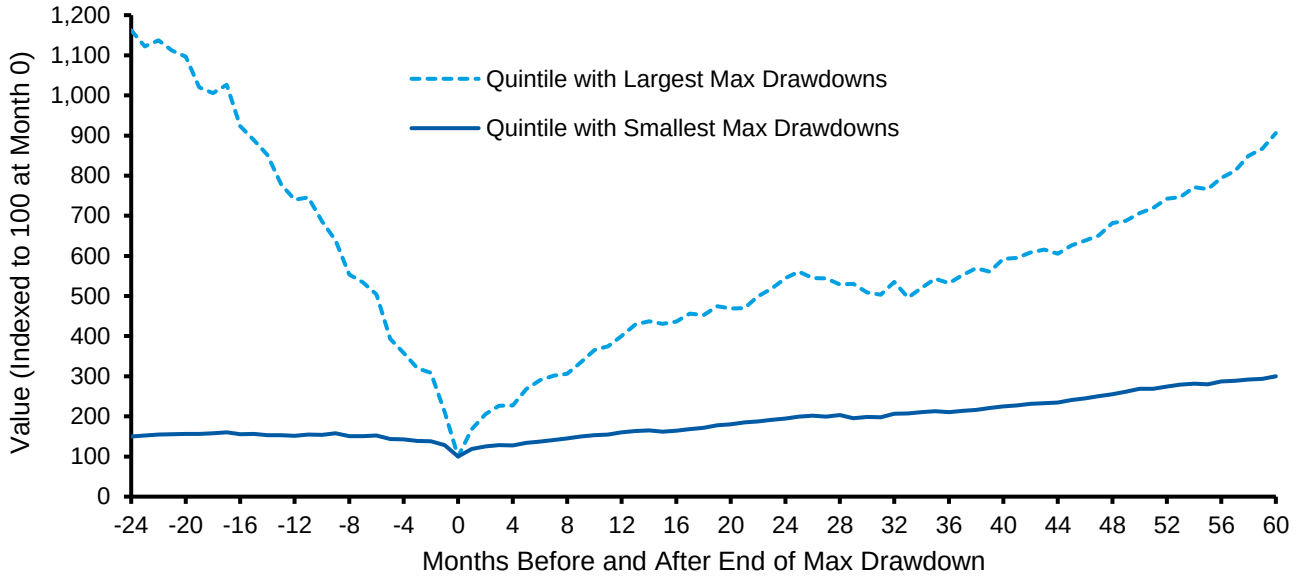
Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that continued trading following their max drawdowns and had a market capitalization of 1 million (2024 U.S. dollars) at end of any month; Reflects intraday prices.

Exhibit 7 takes a slightly different approach but shows the same bounce-back effect. Here, we set the point of maximum drawdown at 100 for each stock and call that month 0. We then track the portfolio value, based on TSRs, of the quintiles of our sample with the largest maximum drawdowns (dotted line) and smallest maximum drawdowns (solid line) for the 24 months prior to the trough, as well as for the 60 months following the trough.

The largest maximum drawdown quintile follows a pronounced “V” pattern, with a sharp decline to the bottom followed by a strong price recovery. The portfolio value of the stocks, though, fails to reach the peak established two years before the bottom. Five years after having hit rock bottom, the price of the portfolio is only 80 percent of what it was two years before the nadir.

The smallest maximum drawdown quintile follows a similar form, by definition, but is markedly less dramatic in its fall and rise. The index value of this portfolio at year five is nearly double what it was two years prior to the bottom. These stocks fully recover and manage solid gains following their lows.

Exhibit 7: Returns of Stocks with Largest and Smallest Max Drawdowns, 1985-2024

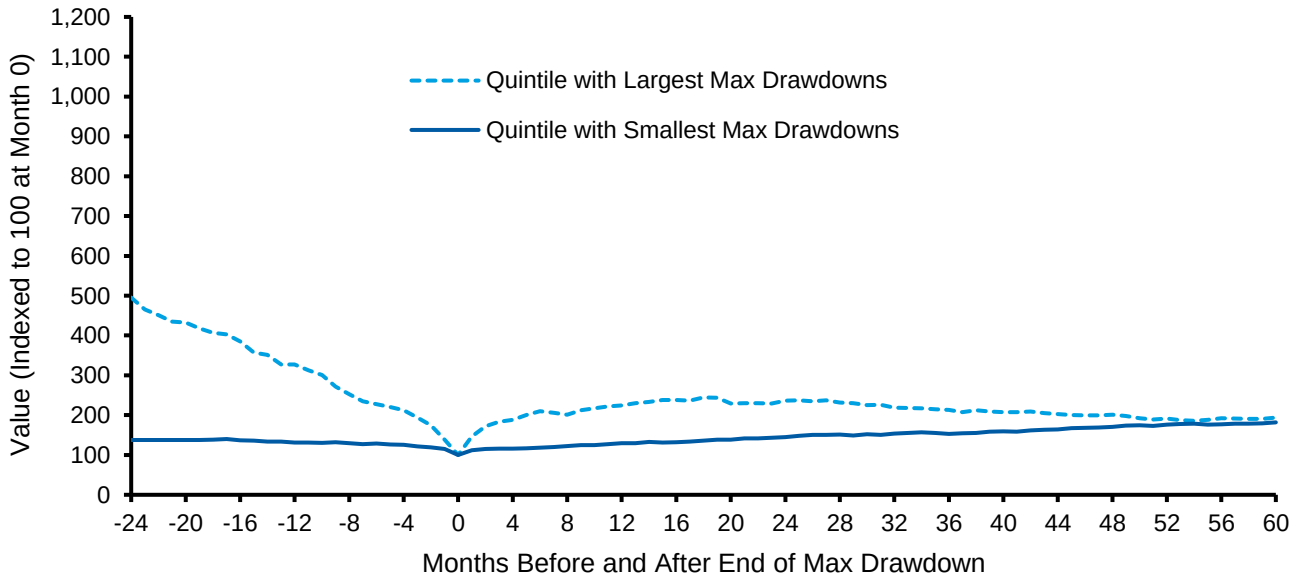


Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that traded for entire period; Excludes companies with less than 1B market cap at beginning and 250M at end of max drawdown (2024 U.S. dollars).

The same analysis with an adjustment for risk (exhibit 8) changes the picture meaningfully. The quintile with the largest maximum drawdowns still has a decline of more than 50 percent annually in the two years preceding the bottom, but the recovery is much more muted. Indeed, 5 years after the maximum drawdown this group's index value is only 40 percent of the value 2 years before the maximum drawdown.

The quintile with the smallest maximum drawdowns declines 15 percent per annum for the 2 years preceding the bottom and rebounds to about 30 percent higher than the pre-drawdown level.

Exhibit 8: Abnormal Returns of Stocks with Largest and Smallest Max Drawdowns, 1985-2024



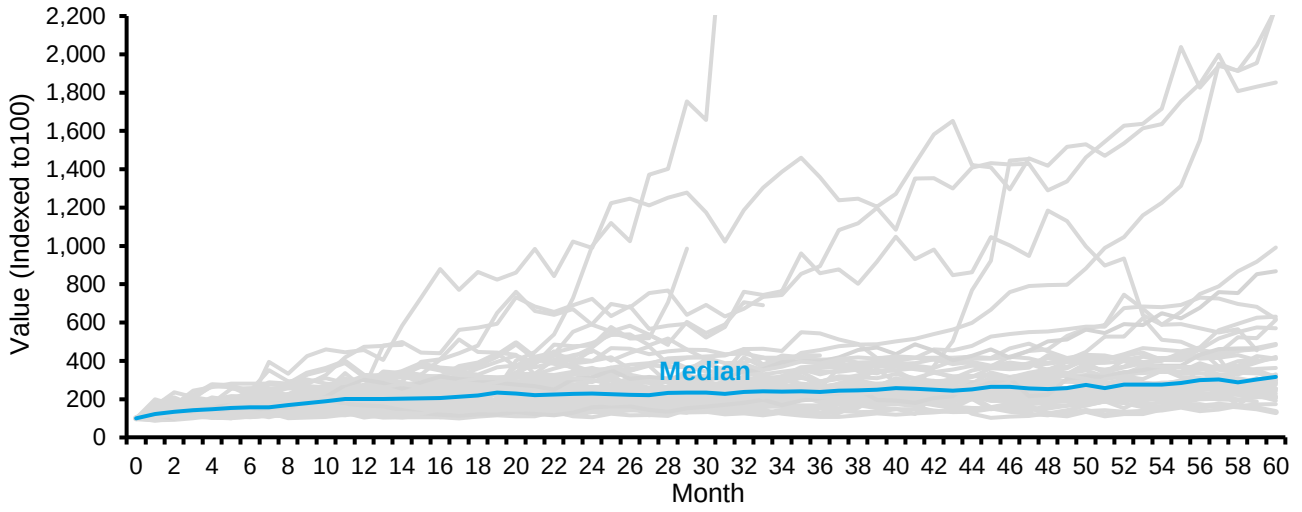
Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that traded for entire period; Excludes companies with less than 1B market cap at beginning and 250M at end of max drawdown (2024 U.S. dollars).

Visualizing Return Patterns

Tables and charts that summarize past performance are useful for getting a sense of base rates for various references classes, but they can obscure the richness of the distributions. Exhibits 9 and 10 address that shortcoming. Here, we select stocks with a maximum drawdown that rounds to 75 percent, benchmark the lowest stock price for each at 100, and track the changes over the next 60 months.[6] Our sample includes 89 stocks.

Exhibit 9 shows the data based on TSRs. If a company stops trading, most likely the result of an acquisition, the line stops at the date of delisting. The median result of a 25.8 percent CAGR is close to the figures in exhibit 5, leading to a median index value of 316 after 5 years. Note the y-axis extends to 2,200 to accommodate the dispersion of results, but some stocks did even better. This reflects skewness that the median figures belie.

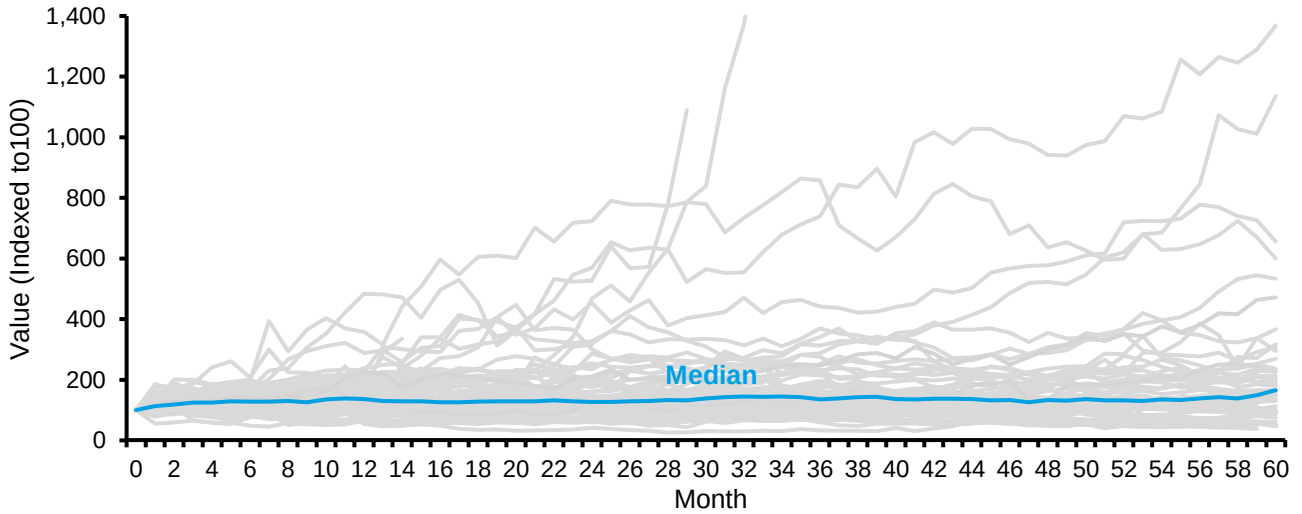
Exhibit 9: Recoveries of Stocks with a Maximum Drawdown of 75 Percent, Using TSR



Source: Counterpoint Global and FactSet.

Exhibit 10 shows the same stocks but reflects abnormal returns. Similar to the result in exhibit 6, the median abnormal return was 10.7 percent and the ending value of the index was 166. In this exhibit, the scale of the y-axis stops at 1,400, which is sufficient to show the results of the full sample. Still, substantial skewness exists.

Exhibit 10: Recoveries of Stocks with a Max Drawdown of 75 Percent, Using Abnormal Returns



Source: Counterpoint Global and FactSet.

Even God Would Get Fired…

Wes Gray is the chief executive officer of Alpha Architect, an asset management firm, and has a PhD in finance from the University of Chicago. He wrote a great piece called, "Even God Would Get Fired as an Active Investor."[7] His point is that if you had the (godlike) foresight to build a portfolio of the stocks that would produce the highest TSRs over the next five years, you would have "great returns, but gut-wrenching drawdowns." In other words, the drawdowns are so large that a client who hired you to be their active manager might fire you.

Gray built his thought experiment on data for the components of the S&P 500, an index of about 500 of the largest stocks in the U.S., or an equivalent precursor index, from 1927 to 2016. The first portfolio was constructed on January 1, 1927, rebalanced every 5 years, and weighted by market capitalization. Over the full period, the perfect-foresight portfolio of the top 50 stocks produced annualized returns three times those of the S&P 500.

The worst drawdown for the perfect-foresight portfolio was 76 percent (August 1929 to May 1932), and there were 5 drawdowns of 30 percent or more. Even the perfect portfolio tests the resolve of those who own it.

The drawdowns of individual stocks are much larger than those of diversified portfolios such as the S&P 500. Exhibit 11 shows the drawdown and recovery data for the 20 stocks with the best TSRs from 1985 to 2024 (top of the exhibit) and the worst TSRs (bottom). Our sample includes only stocks that traded for the full period.

The median maximum drawdown was 72 percent for the best group, and the median maximum drawdown duration, the time from peak to trough, was 2.9 years. The median time to return to the prior peak was 4.3 years. The median annualized abnormal returns following the bottom was 8 percent for the next 5 years and 12 percent for the next 10 years. This is based on the unrealistic assumption the stock was purchased at the low.

For the worst group, the median maximum drawdown was 96 percent, and the median maximum drawdown duration was 8.2 years. Only 35 percent of this group returned to par, and for those that did the median time to recover was 8.9 years. The median maximum drawdown was greater than that for the best TSR stocks, but the even more pronounced difference was the time from peak to trough and back to par. The median annualized abnormal returns following the bottom was 7 percent for both the next 5 years and 10 years.

We can compare the results of individual stocks to that of the S&P 500 to see the benefit of diversification. The maximum drawdown for the index was 58 percent, the maximum drawdown duration was 1.4 years, and the time to recover back to par was 4.2 years. Following the trough, the annual TSR for the S&P 500 was 25 percent over 5 years and 17 percent over 10 years.

Exhibit 11: Drawdowns and Recoveries of U.S. Stocks with Best and Worst TSRs, 1985-2024

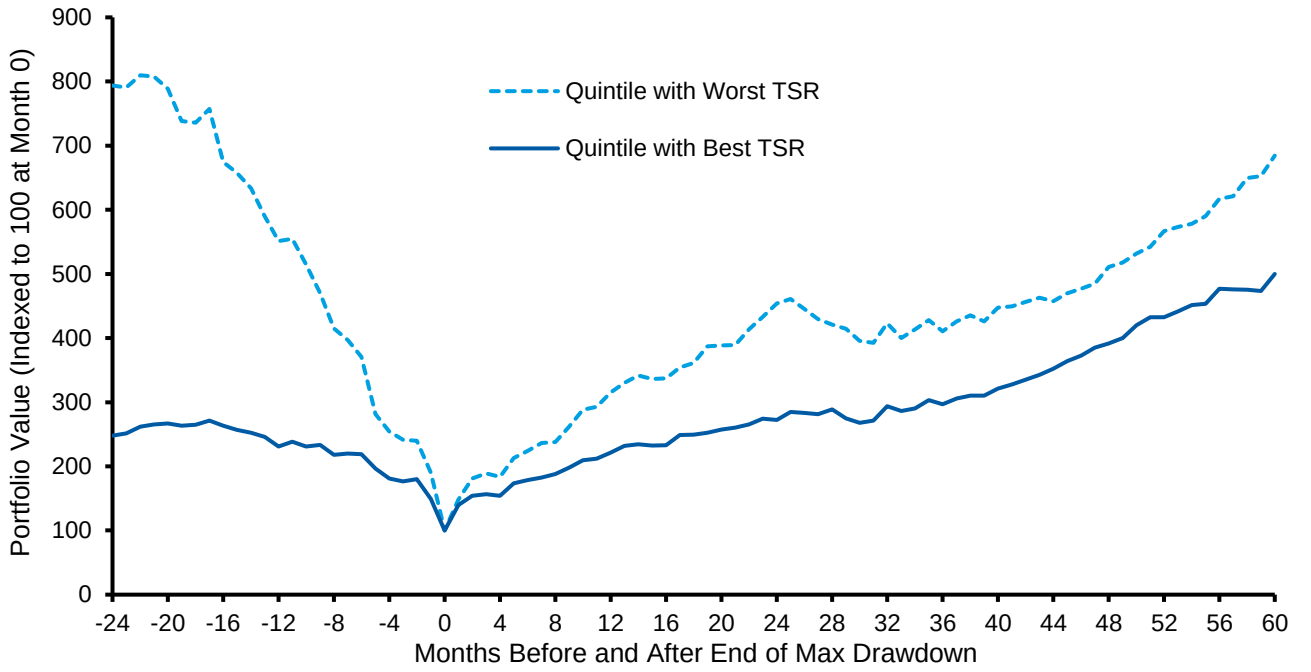
		Annualized TSR, 1985-2024	Max Drawdown	Max Drawdown Duration (Years)	Time Back to Par (Years)	TSR after Max Drawdown, Annualized 1-Yr	3-Yr	5-Yr	10-Yr	Abnormal Return after Max Drawdown, Annualized 1-Yr	3-Yr	5-Yr	10-Yr
	S&P 500	**11.8%**	**-58%**	**1.4**	**4.2**	**71%**	**29%**	**25%**	**17%**	**N/A**	**N/A**	**N/A**	**N/A**
Top 20													
1	Amgen	22.7%	-64%	0.6	1.6	94%	79%	89%	43%	54%	68%	74%	27%
2	Apple	21.6%	-83%	3.1	1.8	123%	117%	88%	52%	71%	95%	65%	44%
3	Paychex	20.8%	-67%	8.3	7.4	52%	19%	19%	18%	-2%	-4%	-5%	1%
4	Home Depot	20.5%	-76%	8.5	4.4	42%	25%	35%	29%	27%	15%	21%	13%
5	Progressive Corporation	20.4%	-74%	1.2	2.1	92%	49%	40%	17%	107%	63%	41%	17%
6	Williams-Sonoma	20.4%	-90%	2.9	2.5	371%	102%	69%	30%	303%	73%	43%	16%
7	Stryker Corporation	19.7%	-60%	1.2	4.8	81%	22%	22%	22%	29%	0%	4%	7%
8	Brown & Brown	19.7%	-58%	2.9	7.1	10%	15%	15%	15%	-18%	-5%	-5%	3%
9	Raymond James Financial	19.6%	-72%	0.5	2.0	145%	48%	38%	24%	52%	9%	6%	-3%
10	HF Sinclair Corporation	19.4%	-87%	1.4	3.7	146%	69%	60%	33%	101%	51%	46%	16%
11	NIKE	19.0%	-66%	3.1	4.0	52%	24%	28%	19%	64%	36%	29%	20%
12	Applied Materials	19.0%	-86%	8.6	9.0	50%	12%	19%	18%	8%	-7%	-12%	-6%
13	Graco	18.9%	-72%	2.9	2.1	112%	56%	43%	28%	10%	10%	-1%	11%
14	Badger Meter	18.8%	-72%	0.2	6.5	66%	15%	20%	17%	45%	2%	3%	8%
15	Expeditors International	18.7%	-59%	2.7	8.4	49%	22%	11%	13%	7%	-1%	-16%	0%
16	Cintas Corporation	17.9%	-68%	6.8	4.7	41%	30%	29%	29%	-28%	4%	6%	10%
17	Gentex Corporation	17.8%	-72%	4.8	2.1	162%	64%	38%	24%	89%	32%	10%	6%
18	Sherwin-Williams	17.2%	-55%	1.8	4.2	38%	13%	20%	15%	43%	26%	21%	16%
19	Eli Lilly and Company	17.2%	-75%	8.7	9.6	35%	19%	23%	21%	-20%	-1%	12%	16%
20	Aflac Incorporated	17.0%	-84%	0.9	7.1	359%	61%	45%	27%	230%	8%	-5%	13%
	Top 20 Average	**19.3%**	**-72%**	**3.5**	**4.8**	**106%**	**43%**	**38%**	**25%**	**59%**	**24%**	**17%**	**12%**
	Top 20 Median	**19.2%**	**-72%**	**2.9**	**4.3**	**73%**	**27%**	**32%**	**23%**	**44%**	**9%**	**8%**	**12%**
Bottom 20													
1	Tutor Perini	0.2%	-97%	12.7	N/A	279%	9%	40%	N/A	183%	-20%	5%	N/A
2	Goodyear Tire & Rubber	0.8%	-96%	10.9	N/A	292%	54%	52%	19%	83%	-24%	-18%	-8%
3	Tejon Ranch Co.	1.4%	-81%	8.8	10.6	23%	30%	15%	14%	-4%	18%	6%	9%
4	Xerox Holdings	1.5%	-97%	25.5	N/A	15%	N/A	N/A	N/A	-11%	N/A	N/A	N/A
5	American International Group	2.0%	-100%	8.2	N/A	369%	69%	55%	23%	82%	-31%	-20%	-1%
6	Kelly Services	2.8%	-84%	11.4	N/A	168%	33%	33%	15%	69%	-13%	-13%	1%
7	Range Resources	3.8%	-98%	5.9	N/A	411%	132%	81%	N/A	237%	94%	42%	N/A
8	Avnet	4.1%	-86%	2.5	4.5	208%	59%	49%	16%	161%	27%	17%	6%
9	Tenet Healthcare	4.2%	-99%	6.4	N/A	415%	79%	64%	20%	307%	23%	8%	-8%
10	Enviri Corporation	4.3%	-95%	8.2	N/A	265%	82%	35%	11%	200%	46%	-4%	-22%
11	PG&E Corporation	4.5%	-95%	2.1	N/A	161%	59%	40%	31%	146%	49%	24%	16%
12	Foot Locker	4.6%	-91%	8.6	13.6	61%	64%	49%	9%	49%	66%	49%	12%
13	Alcoa Corporation	5.1%	-96%	12.7	N/A	384%	93%	47%	N/A	182%	37%	-14%	N/A
14	Newmont Corporation	5.2%	-79%	4.7	5.3	67%	49%	29%	17%	79%	48%	29%	17%
15	Pitney Bowes	5.2%	-98%	20.9	N/A	375%	33%	45%	N/A	194%	-11%	0%	N/A
16	MillerKnoll	5.2%	-81%	2.0	8.9	139%	37%	30%	18%	58%	5%	-4%	-8%
17	Hawaiian Electric Industries	5.3%	-86%	4.3	N/A	12%	N/A	N/A	N/A	3%	N/A	N/A	N/A
18	TEGNA	5.4%	-98%	4.9	N/A	726%	97%	76%	34%	553%	32%	21%	7%
19	Advanced Micro Devices	5.4%	-97%	15.1	4.5	331%	125%	112%	57%	315%	87%	88%	34%
20	Western Digital Corporation	5.5%	-97%	4.6	12.2	111%	61%	55%	30%	149%	49%	41%	25%
	Bottom 20 Average	**3.8%**	**-93%**	**9.0**	**8.5**	**241%**	**65%**	**50%**	**22%**	**152%**	**27%**	**14%**	**6%**
	Bottom 20 Median	**4.4%**	**-96%**	**8.2**	**8.9**	**237%**	**60%**	**48%**	**18%**	**147%**	**30%**	**7%**	**7%**

Source: Counterpoint Global and FactSet.

Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that traded for entire period; Excludes companies with less than 1B market cap at beginning and 250M at end of max drawdown (2024 U.S. dollars).

Inspired by Gray's analysis, we built two portfolios: one including the quintile of stocks with the best TSRs and the other with the quintile of stocks with the worst TSRs (exhibit 12). The bottom price for each stock is set at month 0, so you can see the collective results of each portfolio for the 24 months before, and 60 months after, the trough.

Exhibit 12: Returns of Stocks with the Best and Worst TSRs, 1985-2024



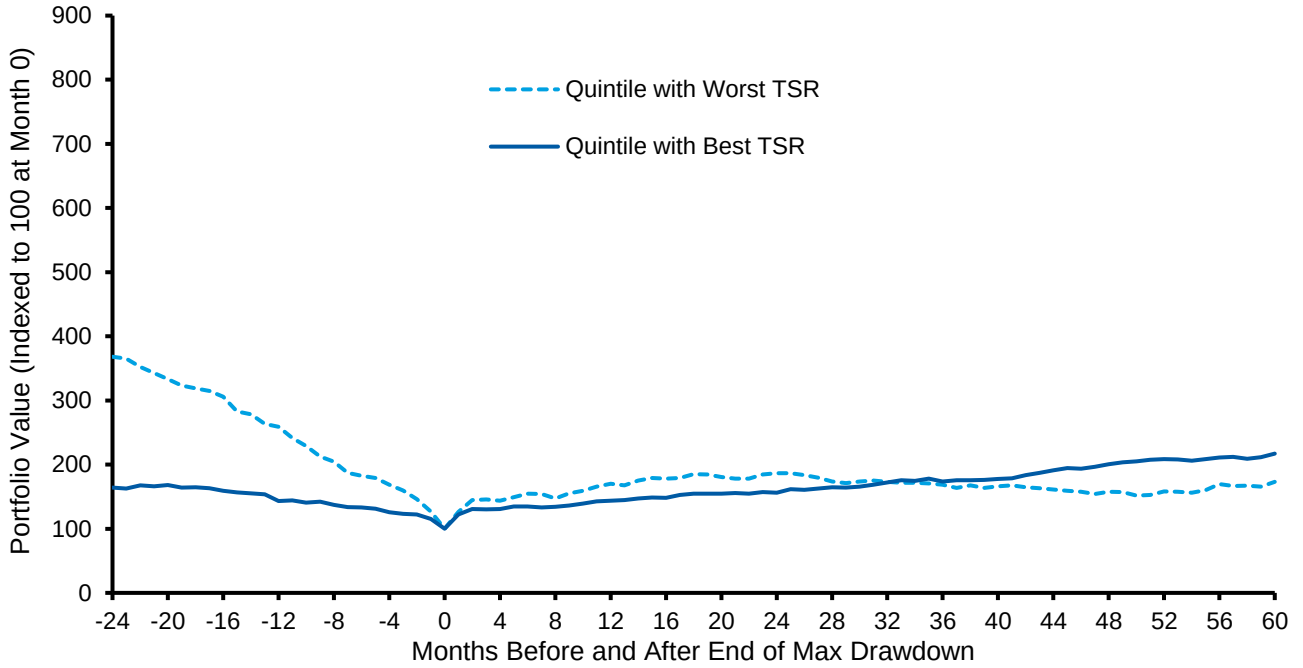
Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that traded for entire period; Excludes companies with less than 1B market cap at beginning and 250M at end of max drawdown (2024 U.S. dollars).

The descent is steep from the price two years prior to the bottom for the stocks with the worst TSRs. This is similar to exhibit 7, which is sorted based on maximum drawdowns. The portfolio of stocks with the worst TSRs appears to rebound strongly, but the indexed price five years after the trough (around 685) remains well below that two years before it (roughly 795). The CAGR is -2.1 percent over the full period.

The stocks with the best TSRs also decline substantially in the two years leading up to the maximum drawdown, and the bounce off the low seems more muted than that for the poor performers. But the price five years after the trough is well above (near 500) where it was two years prior to the bottom (about 250). The CAGR is 10.5 percent over the 7 years.

Exhibit 13 examines the same populations of stocks but considers them after a measure of risk. The stocks with the worst TSRs realize a much sharper downward slope from month -24 to month 0 than those with the best TSRs. And while they appear to perform a bit better off of the low, within five years their performance lags that of the high TSR group. Over the full seven years, the CAGR of the abnormal returns is -10.2 percent for the worst TSR group and 4.1 percent for the best group.

Exhibit 13: Abnormal Returns of Stocks with the Best and Worst TSRs, 1985-2024



Source: Counterpoint Global and FactSet.
Note: Companies listed on New York Stock Exchange, NASDAQ, and NYSE American that traded for entire period; Excludes companies with less than 1B market cap at beginning and 250M at end of max drawdown (2024 U.S. dollars).

It stands to reason that the drawdowns of mutual funds are smaller than those of individual stocks but larger than broad indexes such as the S&P 500, because most mutual funds are more diversified than individual stocks but less diversified than the market. Exhibit 14 shows the returns and maximum drawdowns for the 20 U.S. equity mutual funds with the best, and worst, returns from 2000 to 2024. Our sample includes about 1,000 funds that existed over the full period.

The median drawdown for the top 20 was 59 percent and took 1.6 years to go from peak to trough. These funds went on to produce strong alpha, a measure of risk-adjusted returns, for the 1, 3, 5, and 10 years following the bottom. The median time to return to par was 1.9 years and the average was 2.4 years.

The median drawdown for the bottom 20 was 65 percent and lasted 2.6 years. The median annualized alpha following the trough was zero for all but the initial year, when it was 2 percent. The median time to return to par was 11.6 years and the average was 10.7 years.

The pattern for funds is similar to that of stocks. The best performers go down less and the time from peak to trough is shorter than for the bottom performers. The best performers also take less time to regain their prior peak and deliver superior alpha relative to the bottom performers.

Exhibit 14: Returns and Maximum Drawdowns of U.S. Equity Mutual Funds, 2000-2024

	Annualized Return 2000-2024	Max Drawdown	Max Drawdown Duration (Years)	Time Back to Par (Years)	Return after Max Drawdown, Annualized 1-Yr	3-Yr	5-Yr	10-Yr	Alpha after Max Drawdown, Annualized 1-Yr	3-Yr	5-Yr	10-Yr
S&P 500	**7.7%**	**-58%**	**1.4**	**4.2**	**38%**	**23%**	**17%**	**14%**	**N/A**	**N/A**	**N/A**	**N/A**
Top 20												
1	12.5%	-68%	1.4	4.6	94%	30%	29%	18%	6%	0%	2%	2%
2	12.4%	-65%	1.7	4.2	96%	36%	31%	20%	11%	6%	3%	6%
3	12.0%	-58%	2.2	0.7	185%	48%	38%	N/A	16%	16%	15%	N/A
4	12.0%	-56%	1.7	1.9	73%	36%	29%	17%	3%	3%	1%	0%
5	12.0%	-60%	1.7	2.1	99%	33%	29%	18%	10%	1%	1%	2%
6	12.0%	-62%	1.4	4.2	101%	28%	30%	20%	28%	5%	4%	3%
7	11.9%	-59%	1.5	2.2	76%	29%	29%	16%	14%	6%	5%	0%
8	11.8%	-72%	1.8	1.9	166%	50%	41%	21%	27%	8%	6%	1%
9	11.4%	-68%	1.4	4.4	99%	31%	32%	20%	10%	-3%	2%	0%
10	11.4%	-62%	1.4	2.4	82%	35%	31%	20%	18%	10%	7%	5%
11	11.4%	-74%	1.7	1.9	211%	56%	43%	20%	36%	15%	11%	6%
12	11.4%	-55%	1.8	1.1	111%	35%	29%	17%	8%	-1%	-1%	-2%
13	11.3%	-52%	1.4	2.0	68%	28%	27%	17%	10%	6%	5%	2%
14	11.3%	-63%	1.8	1.9	136%	40%	33%	18%	16%	3%	1%	-1%
15	11.1%	-50%	1.6	1.9	63%	24%	23%	15%	-6%	-6%	-3%	-1%
16	11.1%	-54%	1.8	1.7	89%	38%	28%	21%	6%	5%	1%	3%
17	11.1%	-66%	1.5	4.2	88%	32%	30%	19%	31%	12%	9%	6%
18	11.1%	-52%	0.8	1.9	68%	29%	25%	16%	1%	3%	2%	2%
19	11.0%	-55%	1.7	1.9	83%	33%	29%	18%	1%	2%	2%	1%
20	11.0%	-47%	1.4	0.4	120%	39%	30%	19%	28%	13%	8%	6%
Top 20 Average	**11.6%**	**-60%**	**1.6**	**2.4**	**105%**	**36%**	**31%**	**18%**	**14%**	**5%**	**4%**	**2%**
Top 20 Median	**11.4%**	**-59%**	**1.6**	**1.9**	**95%**	**34%**	**29%**	**18%**	**11%**	**5%**	**3%**	**2%**
Bottom 20												
1	-2.2%	-70%	9.2	N/A	35%	10%	8%	6%	12%	3%	2%	2%
2	-0.4%	-63%	3.0	4.1	54%	29%	20%	7%	-2%	-1%	-1%	-2%
3	0.3%	-68%	3.0	14.8	45%	25%	18%	9%	-5%	-2%	-1%	1%
4	0.6%	-73%	3.0	17.9	48%	26%	19%	8%	-5%	-2%	0%	0%
5	0.9%	-68%	3.2	14.0	62%	36%	15%	7%	N/A	N/A	N/A	N/A
6	1.1%	-65%	3.3	14.7	68%	36%	17%	7%	8%	7%	5%	4%
7	1.3%	-79%	9.0	11.8	74%	20%	20%	13%	3%	-8%	-5%	-5%
8	1.8%	-64%	1.4	8.9	76%	20%	17%	9%	0%	-1%	0%	1%
9	1.8%	-65%	1.4	11.6	65%	19%	17%	8%	0%	-1%	0%	0%
10	1.9%	-64%	8.7	8.9	65%	23%	20%	9%	22%	11%	9%	3%
11	2.1%	-62%	1.4	8.8	70%	22%	17%	9%	1%	0%	1%	0%
12	2.1%	-67%	1.4	11.7	70%	22%	18%	10%	-7%	-2%	0%	0%
13	2.2%	-93%	2.6	21.3	121%	34%	27%	15%	39%	7%	4%	6%
14	2.3%	-32%	0.5	0.6	54%	17%	11%	5%	4%	3%	0%	-1%
15	2.4%	-59%	2.6	3.6	49%	27%	24%	10%	2%	2%	4%	2%
16	2.5%	-80%	2.5	17.7	68%	21%	21%	8%	2%	-10%	-7%	-2%
17	2.5%	-71%	3.2	7.4	76%	24%	23%	15%	37%	15%	16%	10%
18	2.5%	-61%	1.4	8.8	67%	19%	19%	9%	7%	0%	2%	0%
19	2.5%	-53%	1.1	4.5	61%	20%	18%	9%	15%	8%	8%	5%
20	2.5%	-63%	1.4	12.1	60%	18%	16%	8%	-2%	-2%	-1%	0%
Bottom 20 Average	**1.5%**	**-66%**	**3.1**	**10.7**	**64%**	**23%**	**18%**	**9%**	**7%**	**1%**	**2%**	**1%**
Bottom 20 Median	**2.0%**	**-65%**	**2.6**	**11.6**	**65%**	**22%**	**18%**	**9%**	**2%**	**0%**	**0%**	**0%**

Source: Counterpoint Global, Morningstar Direct, and FactSet.
Note: U.S.-domiciled active equity funds with return data for full period.

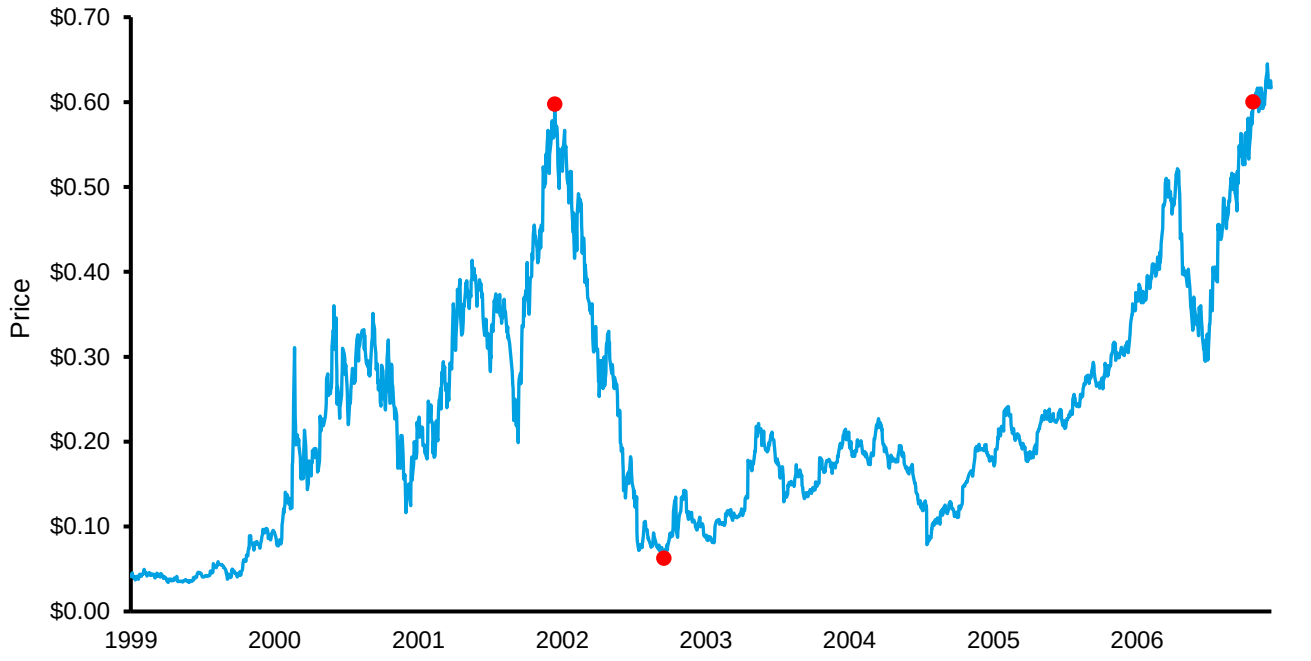
Case Studies

We now share two brief case studies. One shows how suffering can precede a period of extraordinary shareholder returns and the other how suffering can persist.

NVIDIA Corporation. A leading designer of graphics processing units (GPUs) and artificial intelligence (AI) computing platforms, NVIDIA did an initial public offering (IPO) in January 1999 and has been one of the best stocks in the market since that time. In the 20 years ended in 2024, the compound annual return for NVIDIA's stock was 39 percent, making it the leader among all stocks in the S&P 500.

The ride from the IPO to the present has not been all smooth. From January 4, 2002 to October 8, 2002, NVIDIA's stock dropped 90 percent (exhibit 15). This maximum drawdown was larger than the median of 85 percent for all U.S. stocks and happened in 0.8 years versus a median of 2.5 years for the complete sample.

Exhibit 15: NVIDIA's Maximum Drawdown and Recovery to Par, Daily Prices, 1999-2006



Source: Counterpoint Global and FactSet.
Note: Prices adjusted for splits and spinoffs; Dots show beginning and end of max drawdown and return to par.

This precipitous drop was at the tail end of the dot-com bust. Over the same period, the PHLX Semiconductor Sector Index (SOX), an index of the 30 largest U.S. stocks involved in the semiconductor industry, fell 65 percent.

It took 4.1 years, from October 2002 to November 2006, for NVIDIA's stock price to regain its prior peak after hitting bottom. The median time back to par for all companies is 2.5 years. NVIDIA shares fell more quickly and recovered more slowly than the median stock within the S&P.

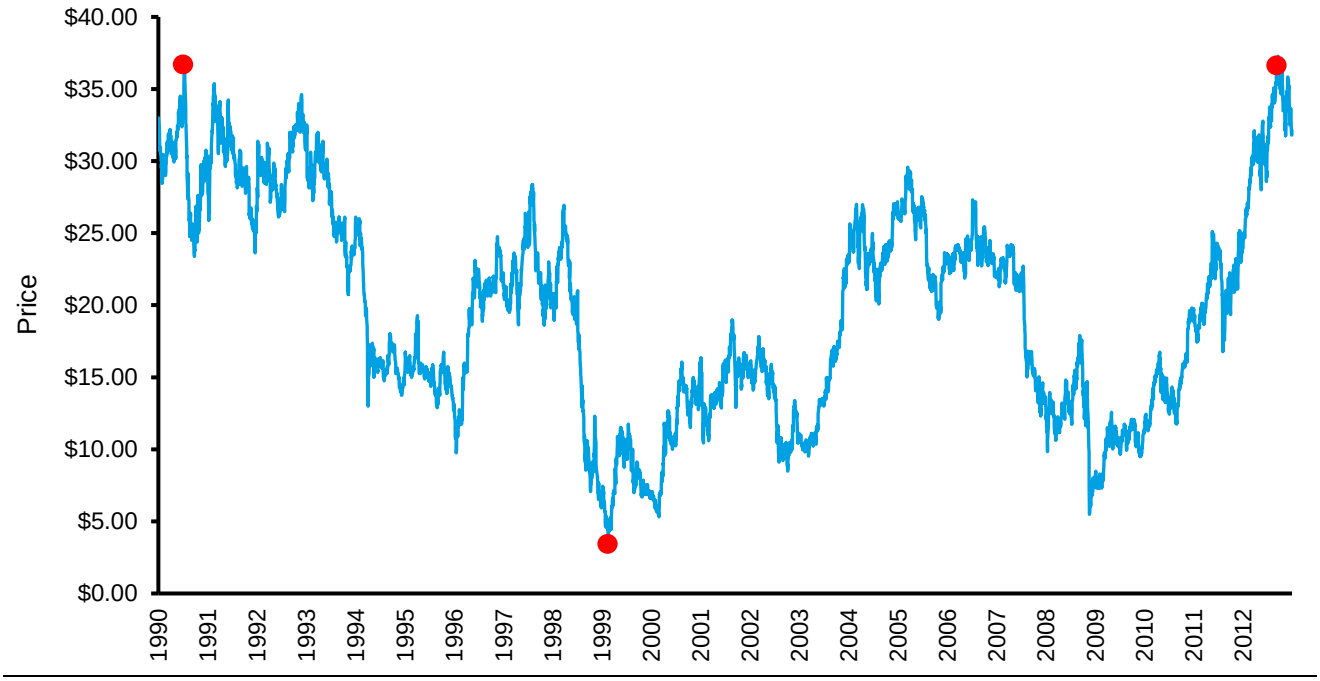
Long-term NVIDIA shareholders have been very richly rewarded. But a 90 percent drawdown is very difficult to deal with psychologically (the market is telling you that you are *very* wrong) and professionally (your clients are asking why you own such a poor performer). Reacting to such a drawdown with equanimity, as Charlie Munger suggests we do, is no easy task.

Foot Locker, Inc. (formerly F.W. Woolworth). Our second case is a household name in the U.S. but has a complicated history. F.W. Woolworth Company, a five-and-dime retail store chain, was founded in 1879 and went public in 1912. In 1963, Woolworth bought a manufacturer and retailer of shoes, Kinney Shoe Corporation, which launched several specialty shoe stores. One of those was Foot Locker, which debuted in 1974.

Woolworth's core business was in decline for decades prior to its last store being closed in 1997. The company changed its name to Venator Group and shuttered the remaining Kinney Shoe stores in 1998. As Foot Locker was Venator's most valuable business, the company changed its name to Foot Locker in 2001.

Reflecting the slide in Woolworth's retail business, the stock had a maximum drawdown of 91 percent from July 13, 1990 to February 18, 1999 (exhibit 16). Unlike NVIDIA's quick drop, it was a protracted decline that lasted 8.6 years from peak to trough. Foot Locker's ascension was even longer. It took 13.6 years, to September 21, 2012, to return to par.

Exhibit 16: Foot Locker's Maximum Drawdown and Recovery to Par, Daily Prices, 1990-2012



Source: Counterpoint Global and FactSet.
Note: Prices adjusted for splits and spinoffs; Dots show beginning and end of max drawdown and return to par.

Base rates tell us about how things turned out in the past. Case studies help us appreciate the importance of context. The magnitude of the drawdown was nearly identical for NVIDIA and Foot Locker, but the circumstances were very different. That it took NVIDIA less than 5 years to go from peak to trough back to peak but it took Foot Locker more than 22 years provides insight into that difference.

NVIDIA declined along with other stocks in its industry whereas Foot Locker dropped at a time when the stocks of a lot of retail companies rose. For example, the shares of Walmart, the largest retailer in the U.S., had a TSR of more than 400 percent over the period of Foot Locker's dramatic drawdown.

In May 2025, Foot Locker agreed to be acquired by DICK'S Sporting Goods for $24.00 per share.[8] That price is 30 percent of the stock's all-time peak price in December 2016.[8]

A Brief Summary of Lessons from Research

One survey paper of stock market drawdowns summarizes our take on the literature. The researchers note that while most papers find signals for predicting stock prices following drawdowns, "the wide diversity in research approaches makes it very difficult to draw general conclusions from past studies."[9]

Perhaps the best known paper in this area is "Does the Stock Market Overreact?" by the financial economists Werner De Bondt and Richard Thaler.[10] They took a large sample of stocks and ranked them based on their returns over the past three years. They then built one portfolio with the stocks that had returns in the top decile ("winner") and another with the stocks in the bottom decile ("loser").

They tracked these portfolios for the following three years and found that the loser portfolio outperformed the winner portfolio. They offered the "overreaction hypothesis" to explain this regression toward the mean. The idea is that investors overreact to good news, causing the stocks in the winner portfolio to overshoot intrinsic value, and overact to bad news, leading the loser stocks to undershoot value.

A recent working paper replicated the reversal patterns that De Bondt and Thaler found but added that while the loser portfolio had high returns on average, the median returns for the stocks in the portfolio were substantially worse.[11] Just as we saw in exhibits 9 and 10, the skew from a handful of outliers produces an average that is much higher than the median.

Hendrik Bessembinder, who did the long-term studies of equity returns, found that "those long-term shareholders who were rewarded with the greatest cumulative returns endured large price declines over shorter intervals."[12] He also found that the companies with the highest stock market returns over a decade "tended to be younger, had larger drawdowns the prior decade, and had higher prior-decade R&D spending, as compared to more typical firms."[13]

Researchers studied the behaviors of retail investors regarding stocks they currently own. They found that investors are roughly 50 percent more likely to buy more shares of a stock after it went down versus when it went up.[14] The psychological rationale is that the lower average cost reduces the investor's reference point, mitigating the likelihood of suffering from loss aversion, the idea that we suffer losses more than we enjoy gains of the same size. This work found that averaging down did not benefit the returns of the investors who did it.

Bill Miller, an investor renowned for managing a fund that beat the S&P 500 15 years in a row, is fond of the phrase, "the lowest average cost wins." Miller explains, "Being willing to lower your average cost [by buying more when a stock drops] is a great strategy. But it's difficult."[15]

What To Look For at the Bottom

No one should be under the illusion that they can buy at the point of maximum drawdown. As Bernard Baruch, the legendary financier, said, “Don’t try to buy at the bottom and sell at the top. It can’t be done except by liars.”[16]

But we do want ways to identify potential winners and to avoid possible losers following large price declines. Here are some qualitative questions to consider:

Are the Fundamental Issues Cyclical or Secular? This point is intuitive and is much easier to assess after the fact than in real time. Some industries go through cycles, generally reflecting ebbs and flows in demand, and therefore have down phases that may be associated with stock price declines for relevant companies. Other industries are in secular decline, which suggests there is no reason to believe that demand will rebound.

Our case studies illustrate this point. The semiconductor industry is cyclical. The boom in demand during the dot-com bubble led to industry overcapacity. The bust in demand following the bubble was especially painful because of that overcapacity. The industry recovered in the ensuing years.

The long slide in the 1990s of Foot Locker, Inc. (formerly known as F.W. Woolworth) reflected the secular decline of the retail operations of Woolworth and Kinney Shoes. Other once-mighty retailers, including Sears Roebuck and K-Mart, suffered similar fates. While overall retail growth remained solid, these chains offered specific formats that fell out of favor with consumers.

Academic research shows that fundamental turnarounds are hard and rare.[17] We studied turnarounds using data from UBS HOLT. A downturn is defined as two years of returns on investment below the cost of capital following two years of returns on investment above the cost of capital. A sustained turnaround is three years of returns above the cost of capital following the downturn.

The study included nearly 1,200 companies in the technology and retail sectors. Only 29 percent of companies had a sustained turnaround and nearly one-half had no turnaround at all.[18]

What Does the Basic Unit of Analysis Tell You About the Business? The basic unit of analysis reveals how a company makes money. For example, for a subscription business it is customer lifetime value, which subtracts customer acquisition costs from the present value of the cash flows a customer will generate for the duration of engagement with the firm.[19]

The stock of a company can recover if its basic economic proposition creates value. Companies that have grown too quickly, hence investing more than they earn, can slow growth and regain their economic footing. But recovery is unlikely if the underlying business proposition is flawed or economies of scale are elusive.

How Lumpy Are the Investments in the Business? All businesses have pre-production costs (investments) that precede sales and profits. These investments can be in small or large increments.

For instance, Shake Shack, the fast casual restaurant chain, estimates that building a new store costs between $1.5 and 3.0 million.[20] In contrast, Taiwan Semiconductor Manufacturing Company (TSMC), the largest semiconductor contract manufacturing firm in the world, recently spent about $20 billion to build a new semiconductor fabrication plant (fab) in Arizona.[21]

This is relevant because it is easier to scale down small investments than large investments. Businesses that have to invest a large sum can run into trouble before they generate sales and profits. This has happened repeatedly in the casino industry, for example.

Is There Sufficient Financial Strength? A sharp decline in a stock price can predict financial distress. Research shows that distressed stocks underperform safer stocks.

Academics built a model based on accounting measures, including net income to assets, cash holdings, leverage, and price-to-book ratio, and found that the stocks of the companies that scored poorly on these measures were subpar investments.[22]

This means that an assessment of financial viability is essential before considering purchasing a stock after a large drawdown.

Is There Access to Capital If Needed? Capital markets can be fickle. In some periods, capital is easy for companies to access and relatively inexpensive. In other periods, markets essentially shut down and the ability to raise capital is onerous and costly.

A lack of liquidity can be problematic even if a company is solvent. Liquidity is the money a company needs to meet its short-term obligations. Solvency reflects a company's ability to meet it long-term obligations. A run on the bank is an example where a solvent institution can fail because of a liquidity problem. More broadly, a business puts itself at risk any time it uses short-term funding for long-term investment.

Matt Levine, the excellent columnist at Bloomberg, provides an example of a bank with $100 of healthy mortgage loans outstanding, $20 in cash, and $100 in deposits. The bank is solvent as its assets, mortgages and cash, are greater than its liability, deposits. But the bank does not have the liquidity to accommodate the case where all of the depositors show up at the same time to get their money back. The bank is solvent but not liquid.[23]

The Federal Deposit Insurance Corporation (FDIC) insures deposits so that depositors do not have to worry about getting their money back, quelling the risk of bank runs. But plenty of other businesses have a financing mismatch that can lead to the demise of businesses that are solvent.

Is Management Clear-Eyed about the Challenges? Finally, you want a management team that understands whatever challenges it faces and is willing to take appropriate action to preserve and ultimately enhance the value of the operations.

Some senior executives at Enron Corporation, primarily an energy and commodities company, ignored internal and external questions about the quality of the business just prior to its bankruptcy filing in 2001.[24] The first step in the path to recovery is acknowledgement of the hurdles the business faces.

Conclusion

Long-term investors need to be aware of the pattern of drawdowns and be prepared to face them when they inevitably occur. The best investors and stocks suffer through large drawdowns, which can be considered a cost of doing business over the long haul.

The median drawdown for the 6,500 stocks in our sample from 1985-2024 was 85 percent and took 2.5 years from peak to trough. More than one-half of all stocks never recover to their prior highs.

Relative to smaller drawdowns, larger drawdowns, on average, take longer to occur, recover to the previous peak less often, and yet can provide attractive returns off the lows. Recoveries from drawdowns of all sizes have significant skewness, which means some stocks do extremely well relative to the pack. As a result, average returns from rebounds are higher than median returns.

An investor who had the perfect foresight to create a portfolio of the stocks with the highest returns in the next five years would still see substantial drawdowns along the way. Indeed, one five-year stretch of the foresight portfolio had a 76 percent drawdown. This underscores how hard it is for professionals to manage through drawdowns.

Mutual fund results follow a similar pattern. While the absolute levels of drawdowns were less than those of individual stocks, the average drawdown for the top 20 funds for the 25 years through 2024 was 60 percent. These funds subsequently produced substantial excess returns.

We examined case studies for NVIDIA and Foot Locker. Both stocks had drawdowns of about 90 percent, but NVIDIA went on to be the best performing stock in the S&P 500 for the 20 years ended in 2024 and Foot Locker agreed to be acquired at 30 percent of its peak price. In part, the cases contrast cyclical versus secular causes of decline.

Academic research shows that stocks that have done poorly in the recent past (losers) produce better returns than the stocks that have fared well (winners). This is explained by the overreaction hypothesis, which suggests that investors push prices beyond their intrinsic value.

A closer examination of results for the loser portfolio shows that the median stock does poorly but that the average is pulled up by a handful of outliers. Some investors do like to buy more of a stock they own that is down. This lowers their reference point and mitigates the likelihood of suffering from loss aversion.

Trying to pick a bottom is a fool's errand. But we offer some qualitative considerations for whether it makes sense to play a rebound. These include an assessment of whether cyclical or secular factors induced the drawdown, whether the basic unit of analysis is viable, how lumpy investments are, the financial strength and staying power of the company, whether there is access to capital if need be, and whether management is dealing with the challenges head-on.

Endnotes

[1] "Charlie Munger: Boom and Bust Is Normal," *BBC News*, October 26, 2009.
[2] Warren E. Buffett, "The Superinvestors of Graham-and-Doddsville," *Hermes: The Columbia Business School Magazine*, Fall 1984, 4-15.
[3] Hendrik Bessembinder, "Do Stocks Outperform Treasury Bills?" *Journal of Financial Economics*, Vol. 129, No. 3, September 2018, 440-457. For updated data see: https://wpcarey.asu.edu/department-finance/faculty-research/do-stocks-outperform-treasury-bills.
[4] Our data go beyond 2024 for most of our exhibits. The data are through January 31, 2025 for exhibits 1-6 and 11, and through April 11, 2025 for exhibits 7-10 and 12-13. Extending the study beyond year-end 2024 allowed us to include many stocks that were hit hard by COVID for the full 60 months following their maximum drawdowns in March and early April 2020.
[5] The expected return is the TSR of the S&P 500, an index that tracks the stocks of 500 large companies in the U.S., times the stock's beta. We use FactSet to measure beta, using monthly returns for the prior 60 months. Beta is the slope of the best-fit line based on a regression analysis with the S&P 500's price returns as the independent variable (x-axis) and each stock's price returns as the dependent variable (y-axis). Our calculation of abnormal returns depends on the starting date of the maximum drawdown due to the availability of monthly total returns for the S&P 500 in FactSet. Prior to 1992 we use price returns for both the stock and the S&P 500, and from 1992-on we use TSRs for both.
[6] The sample includes all stocks with a maximum drawdown between minus 74.500% and minus 75.499%.
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[15] Jason Zweig, "Bill Miller: What's Luck Got to Do With It?" *Money Magazine*, July 18 2007. For a counter view, Paul Tudor Jones, a very successful investor, had a sign by his desk that said, "Losers Average Losers." See Michael Covel, "Paul Tudor Jones: Losers Average Losers," *Trend Following*, February 2009. This reflects the difference in their investment strategies (Miller is a value investor and Tudor Jones a trend follower). When a stock goes up value investors tend to sell and trend followers tend to buy. When a stock goes down value investors tend to buy and trend followers tend to sell.
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[17] Jeffrey L. Furman and Anita M. McGahan, "Turnarounds," *Managerial and Decision Economics*, Vol. 23, Nos. 4-5, June-August 2002, 283-300.
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[19] Daniel M. McCarthy, Peter S. Fader, and Bruce G.S. Hardie, "Valuing Subscription-Based Businesses Using Publicly Disclosed Customer Data," *Journal of Marketing*, Vol. 81, No. 1, January 2017, 17-35.

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[24] During a conference call with analysts on April 17, 2001, Jeff Skilling, then chief executive officer of Enron, called an analyst an "a**hole" after he noted that the company was the only one in its industry that did not issue a balance sheet along with its earnings release.

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