



Contrarian Investing During a Sell-Off: An Update

High inflation and rising rates complicate the analysis.

October 2022

KEY INSIGHTS

- Market declines in the first half of 2022 may have left some investors wondering if the time is right to raise exposure to stocks and other risk assets.
- Our earlier study of historical sell-offs found that adding equity exposure typically enhanced returns, even if the exact timing was early or late.
- Narrowing our focus to five past sell-offs that also featured high inflation and rising interest rates suggests a more cautious approach may be needed now.

The first half of 2022 was a particularly challenging period for investors. High inflation, coupled with extended equity valuations and rising U.S. interest rates, led to twin sell-offs across both stocks and bonds. In the wake of such a significant market drawdown, many investors might be wondering if the time is right to lean back into stocks and other risk assets.

While T. Rowe Price takes a long-term strategic approach to portfolio design, we do believe that tactical asset allocation—shorter-term adjustments in portfolio positions—can enhance returns by taking advantage of shorter-term relative value opportunities, such as those that potentially may be created in severe market drawdowns.

However, few, if any, investors can successfully identify the precise trough, or lowest price level, of an extended

market drawdown. This raises the question: What are the potential penalties for being too early or too late in making a tactical shift?

We previously examined this issue after the COVID-19 pandemic generated a major sell-off in U.S. and global equities in the first quarter of 2020. In that study, we looked at returns following 17 prior U.S. market declines in which the S&P 500 Index sold off by 15% or more, beginning with the 1929 crash and ending with the December 2018 market correction. More recently, we updated our analysis to include the COVID-19 sell-off (Figure 1).¹

Surprisingly, we found that adding U.S. equity exposure anywhere from three months before to three months after the absolute trough in all 18 market drawdowns (including the COVID-19 sell-off) still enhanced returns, on average, over the following 12 months.



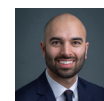
Megumi Chen, CFA

*Quantitative Investment Analyst,
Multi-Asset*



Sébastien Page, CFA

Head of Global Multi-Asset



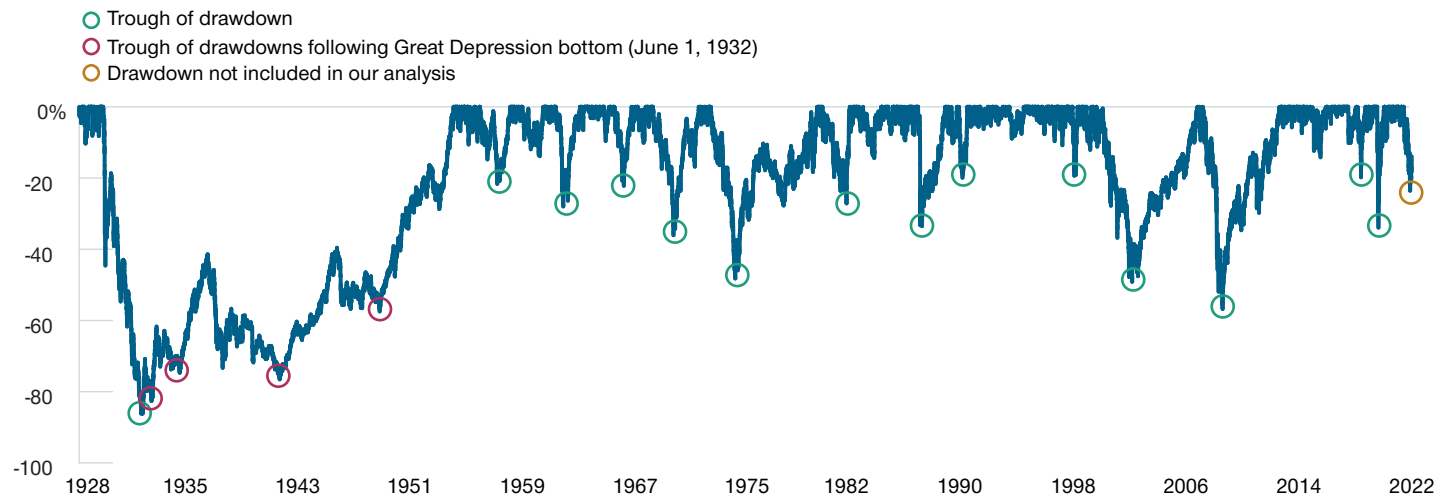
Som Priestley, CFA

Multi-Asset Solutions Strategist

¹ Complete return data for the December 2018 correction and the 2020 COVID-19 sell-off were not yet available for all of the time frames we examined in our analysis. See the notes to Figure 2 for more information on the periods not included.

The Bear Facts: Major U.S. Equity Sell-Offs Since 1928

(Fig. 1) Historical drawdowns of 15% or more in the S&P 500 Index*



Past performance is not a reliable indicator of future performance.

As of July 31, 2022.

*We used S&P 500 Index price data from January 3, 1928, through July 31, 2022, to identify drawdowns of 15% or more from a previous absolute market peak. We then identified the date marking the trough for each drawdown. However, in order to capture market sell-offs during and immediately after the Great Depression (with troughs on February 27, 1933; March 14, 1935; April 28, 1942; and June 13, 1949), we set June 1, 1932, as the new floor and identified subsequent market peaks and drawdowns from that date. The most recent S&P 500 sell-off—the market drawdown in early 2022—was not included in our analysis. The most recent trough is marked as not included in the analysis (yellow circle in key).

Source: Bloomberg Finance L.P. (see Additional Disclosures). All data analysis by T. Rowe Price.

However, economic fundamentals matter—and high inflation and rising interest rates present a particularly challenging environment for risk assets. That being the case, we narrowed the focus of our analysis to five historical U.S. equity market drawdowns that occurred during periods of high inflation and high and/or rising interest rates. In our view, the results of this targeted study suggest that a little more patience may be required before increasing exposure to equities and other risk assets in the current market environment.

Reflecting this view, the T. Rowe Price Asset Allocation Committee (AAC) continued to hold an underweight position in stocks relative to bonds as of September 30, 2022. However, going forward, the AAC may consider raising equity exposure in its positioning if it observes some combination of a less

aggressively hawkish U.S. Federal Reserve and an improvement in economic and earnings visibility.

Lessons From History

In both our original and our updated tactical analysis, we recognized that for most investors, tactical investment decisions are likely to be made in the context of their long-term strategic allocations—not as a shift from 100% to 0% exposure in favor of stocks or bonds.

For our analysis, we assumed a hypothetical allocation of 60% U.S. stocks and 40% U.S. bonds (60/40) and a hypothetical allocation of 70% U.S. stocks and 30% U.S. bonds (70/30), using index data.² We also assumed that a hypothetical investor shifted from the 60/40 mix to the 70/30 mix whenever they believed the market had reached a drawdown trough.

² The equity component of the hypothetical portfolio was represented by daily total returns on the S&P 500 Index. The bond component was represented by an estimate of daily interpolated returns for the Ibbotson Intermediate Government Bond Index from January 3, 1928, through December 29, 1961, and 5-year U.S. Treasury total returns where daily data were available from January 2, 1962, through July 31, 2022. This analysis did not reflect the fees and costs associated with actual investments.

Adding U.S. Equity Exposure in Past Sell-Offs Typically Boosted Returns

(Fig. 2) Average cumulative return differentials and [success rates] for a hypothetical 70% U.S. stock/30% U.S. bond allocation versus a hypothetical 60%/40% allocation*

Return Time Frame	Trading Days Before Trough					At Trough	Trading Days After Trough				
	126 Days (6 Months)	63 Days (3 Months)	21 Days (1 Month)	10 Days (2 Weeks)	5 Days (1 Week)		5 Days (1 Week)	10 Days (2 Weeks)	21 Days (1 Month)	63 Days (3 Months)	126 Days (6 Months)
1 Month (21 Trading Days)	-0.22%	-0.30%	-1.41%	-0.15%	0.23%	1.05%	0.32%	0.24%	0.58%	0.22%	0.19%
	[44%]	[28%]	[0%]	[33%]	[72%]	[94%]	[67%]	[56%]	[78%]	[61%]	[72%]
3 Months (63 Trading Days)	-0.45	-2.21	-0.13	0.72	1.41	2.52	1.63	1.21	1.61	0.58	0.59
	[44]	[0]	[50]	[72]	[78]	[94]	[83]	[78]	[78]	[83]	[78]
6 Months (126 Trading Days)	-2.56	-0.57	0.80	1.56	2.10	3.17	2.24	2.13	2.05	1.24	1.49
	[0]	[22]	[72]	[94]	[94]	[100]	[94]	[100]	[100]	[83]	[89]
12 Months (252 Trading Days)	-0.59	0.59	2.52	3.31	4.03	5.35	4.17	3.90	4.10	2.25	1.75
	[44]	[56]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[89]	[83]
18 Months (378 Trading Days)	0.82	1.51	2.91	3.58	4.32	5.66	4.26	4.22	4.46	3.16	2.46
	[56]	[78]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[94]	[89]
36 Months (756 Trading Days)	1.54	2.03	3.97	4.70	5.29	6.75	5.21	4.79	5.12	3.38	3.30
	[65]	[71]	[94]	[94]	[94]	[94]	[94]	[88]	[94]	[88]	[71]
60 Months (1,260 Trading Days)	2.54	4.05	6.51	7.60	8.23	9.68	8.18	7.65	8.28	5.01	4.21
	[69]	[69]	[88]	[81]	[88]	[88]	[88]	[88]	[88]	[75]	[75]

■ >2% ■ 1% to 2% ■ -1% to -2% ■ <-2%

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As of July 31, 2022.

*The 2020 COVID-19 sell-off was the most recent event examined in our analysis. However, 36-month and 60-month returns were not yet available for the starting points shown before and after the trough of that downturn. Similarly, 60-month returns were not yet available for starting points before and after the trough of the December 2018 market sell-off. Accordingly, results for those periods are not included in the averages above.

Sources: Bloomberg Finance L.P., Morningstar (see Additional Disclosures), and U.S. Treasury/Haver Analytics.

This chart contains hypothetical analysis, which is shown for illustrative purposes only and is not indicative of actual investment results. The results shown do not reflect fees and costs associated with investing. Actual investment results may vary significantly, and all investments are subject to risk, including possible loss of principal. See additional important disclosures at the end. Index performance is for illustrative purposes only and is not indicative of any specific investment. Investors cannot invest directly in an index. Equity returns are based on daily S&P 500 Index total returns from January 3, 1928, through July 31, 2022. Fixed income returns are based on an estimate of daily interpolated returns for the Ibbotson Intermediate Government Bond Index from January 3, 1928, through December 29, 1961, and on daily total returns for the 5-year U.S. Treasury note where daily data were available from January 2, 1962, through July 31, 2022. The return differentials shown above are measured between the cumulative total returns for a hypothetical 70% U.S. stock/30% U.S. bond allocation and a hypothetical 60%/40% allocation in the periods shown, averaged across 18 major historical U.S. equity sell-offs. A major sell-off was defined as a decline of 15% or more in the S&P 500 Index. The success rate is the percentage of performance periods in which the 70/30 hypothetical allocation outperformed the 60/40 hypothetical allocation. "Trading Days Before Trough" and "Trading Days After Trough" represent the starting period for the average returns. Results shown were derived from daily rebalancing and daily cumulative returns.

We then measured cumulative returns on the hypothetical 70/30 allocation relative to the hypothetical 60/40 allocation over various time periods beginning before and after each market trough. These returns were averaged across all 18 of the drawdowns we examined (Figure 2). Updating

the broader analysis to include the COVID-19 sell-off did not significantly alter the results.

Our broad study found that if a hypothetical investor shifted from the hypothetical 60/40 allocation to the hypothetical 70/30 allocation mix on

the exact date of each of the 18 troughs we examined—the potential gains were quite high across most time frames. For example:

- Over the 12 months following the trough, the hypothetical 70/30 allocation earned an average 5.35 percentage points (pps) of excess return relative to the 60/40 allocation.
- The 70/30 mix outperformed the 60/40 allocation over the 12 months following the trough in all 18 of the sell-offs we examined.

An even more important finding in our broader analysis was that, historically, it wasn't necessary to time drawdowns precisely in order to generate potentially strong excess returns:

- If our hypothetical investor had shifted to a 70/30 allocation one month (21 trading days) before the exact market trough, subsequent 12-month excess

returns across the 18 drawdowns were 2.52 pps higher, on average, than a 60/40 allocation.

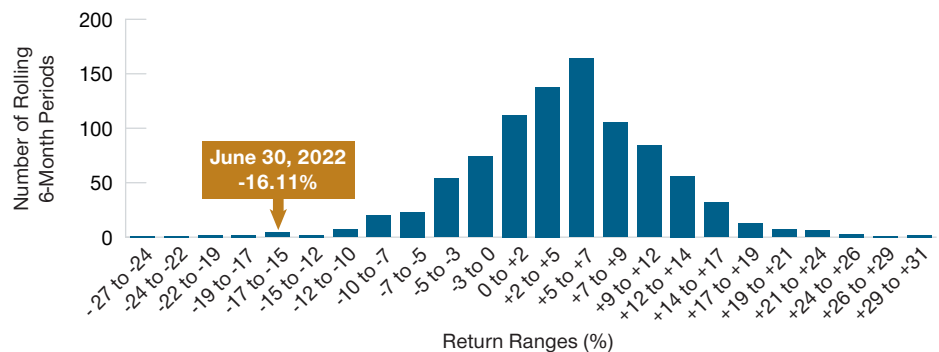
- Raising equity exposure one month after the trough produced roughly similar results, although 12-month excess returns for the 70/30 allocation were even higher—an average 4.10 pps relative to the 60/40 allocation.
- In both cases—one month before and one month after the trough—the 70/30 allocation outperformed the 60/40 allocation in 100% of the subsequent 12-month periods we examined.

Applying Our Framework to the Current Sell-Off

The financial market declines seen in early 2022 were particularly steep in a historical context. Over the six months ended June 30, 2022, a hypothetical 60/40 allocation (represented by the S&P 500 Index and the Bloomberg

Recent U.S. Equity and Fixed Income Losses Were Near the Extreme of Their Historical Range

(Fig. 3) Distribution of rolling six-month returns for a hypothetical 60% U.S. stock/40% U.S. bond allocation



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December 31, 1945, through June 30, 2022

Sources: Standard & Poor's, Morningstar, and Bloomberg Finance L.P. (see Additional Disclosures).

Equity returns are represented by the S&P 500 Index. Bond returns are represented by the Ibbotson Intermediate Government Bond Index (January 1946 through December 1975) and the Bloomberg U.S. Aggregate Bond Index (January 1976 through June 2022). Hypothetical allocation was rebalanced to 60/40 monthly.

The Early 2022 Sell-Off Resembled Past High Inflation Downturns

(Fig. 4) U.S. consumer price index (CPI) and 10-year Treasury yield at market troughs

Trough	S&P 500 Drawdown*	CPI at Trough (YoY % Change)	10-Year Treasury Yield at Trough (%)	10-Year Treasury Yield Change From Previous S&P 500 Peak (pps)
May 26, 1970	-36.1%	6.0%	8.22%	+2.44
October 3, 1974	-48.2	11.8	8.04	+1.61
August 12, 1982	-27.1	6.0	13.55	+0.83
December 4, 1987	-33.5	4.3	8.94	+0.21
October 11, 1990	-19.9	6.4	8.92	+0.48
June 16, 2022[†]	-23.6	9.0	3.28	+1.65

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As of July 31, 2022. YoY=Year-over-Year

*Represents percentage decline at trough from previous market peak.

[†] Not included in study. Trough date may change.

Sources: Federal Reserve Bank of St. Louis, T. Rowe Price calculations using data from FactSet Research Systems Inc. All rights reserved.

U.S. Aggregate Bond Index) returned -16.11%,³ a result that fell within the lowest percentile of returns for all historical rolling six-month periods since 1945 (Figure 3).

If returns on the 60/40 allocation were distributed normally (that is, across a smooth bell-shaped curve), a six-month loss of such magnitude would be expected to occur only once every 304 years. However, the existence of “fat tails” (disproportionally large numbers of extreme values) challenges the assumption of a normal distribution for financial asset returns.

The unusually sharp equity declines of early 2022 were accompanied by—and driven by—exceptionally high inflation, as global energy and food prices jumped in the wake of Russia’s invasion of Ukraine. The U.S. consumer price index (CPI) rose 9% over the 12 months ended in June 2022—the fastest increase in more than four decades.

Reacting to these inflation dynamics, the U.S. Federal Reserve moved quickly to tighten monetary policy, producing a dramatic spike in U.S. Treasury yields. The yield on the 10-year U.S. Treasury note nearly doubled in the first six months of 2022 before easing at the start of the second quarter.

In light of these conditions, we decided to narrow our analysis to look at previous U.S. market drawdowns that posed similar challenges for equity investors. This focus led us to concentrate on five historical U.S. equity sell-offs that featured both high inflation and rising interest rates—conditions similar to those that have defined the 2022 market environment, in our view (Figure 4).⁴

The results of our new analysis can be found in Figure 5. They suggest that a more patient approach to buying stocks may be warranted when the underlying inflation and interest rate fundamentals are unusually poor.

³ Not including management fees or other investment costs.

⁴ In our new analysis, we defined a high inflation sell-off as one in which the year-over-year change in the U.S. CPI was above 4% at the trough for the S&P 500 Index. Interest rate increases were measured by the change in the 10-year Treasury yield from the previous S&P 500 peak to the S&P 500 trough.

Caution May Be Needed When Inflation Is High and Interest Rates Are Rising

(Fig. 5) Average cumulative return differentials and [success rates] across five high-inflation, rising-rate U.S. equity sell-offs

Return Time Frame	Trading Days Before Trough					At Trough	Trading Days After Trough				
	126 Days (6 Months)	63 Days (3 Months)	21 Days (1 Month)	10 Days (2 Weeks)	5 Days (1 Week)		5 Days (1 Week)	10 Days (2 Weeks)	21 Days (1 Month)	63 Days (3 Months)	126 Days (6 Months)
1 Month (21 Trading Days)	-0.17%	-0.36%	-1.14%	0.02%	0.26%	1.09%	0.15%	-0.34%	-0.35%	0.50%	0.21%
	[40%]	[20%]	[0%]	[60%]	[80%]	[100%]	[60%]	[20%]	[40%]	[60%]	[60%]
3 Months (63 Trading Days)	-0.09	-2.35	-0.59	-0.13	0.18	0.97	0.32	0.22	0.32	0.96	0.56
	[40]	[0]	[20]	[60]	[40]	[80]	[80]	[80]	[80]	[80]	[60]
6 Months (126 Trading Days)	-2.48	-1.81	0.40	0.82	1.06	2.06	1.35	1.06	1.02	1.61	0.66
	[0]	[0]	[60]	[100]	[100]	[100]	[100]	[100]	[100]	[80]	[80]
12 Months (252 Trading Days)	-1.18	-0.52	1.33	1.78	1.93	3.01	2.06	1.75	1.59	1.94	0.79
	[20]	[20]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[80]
18 Months (378 Trading Days)	-0.57	-0.32	1.58	1.98	2.13	3.29	2.37	2.07	1.97	2.50	1.08
	[20]	[40]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[80]
36 Months (756 Trading Days)	-0.19	-0.49	1.32	1.63	2.01	2.99	1.93	1.48	1.06	1.92	0.87
	[60]	[40]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[100]	[60]
60 Months (1,260 Trading Days)	-0.42	0.44	4.19	5.38	5.90	6.83	5.67	4.80	4.76	3.22	1.78
	[40]	[40]	[80]	[80]	[80]	[80]	[80]	[80]	[80]	[80]	[80]

■ >2% ■ 1% to 2% ■ -1% to -2% ■ <-2%

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For example, when we examined the performance of an investor who shifted from a hypothetical 60/40 allocation to a 70/30 allocation three months (63 trading days) before the trough of a high inflation/rising interest rate drawdown, we found that:

- Excess returns were reduced by an average 0.52 pps over the following 12-month period versus a 0.59 pps average return gain across the full sample of 18 drawdowns.

- The hypothetical 70/30 allocation outperformed the 60/40 allocation in only 20% of all following 12-month periods versus a 56% success rate across the full sample.
- Negative excess returns were experienced for at least three years following the shift to a hypothetical 70/30 allocation.

Compared with the full sample, we also found a less compelling case for being early, as opposed to late, in high inflation/rising rate sell-offs. Indeed, there

appeared to be asymmetric benefits to adding to equities after the market trough.

For example, a shift to a hypothetical 70/30 allocation three months after the trough of a high inflation/rising rate drawdown enhanced 12-month forward excess returns by an average 1.94 pps versus a 0.52 pps reduction from making the same shift three months before the trough.

While the sample size of high inflation/rising rate sell-offs is admittedly small, the results of our updated analysis still suggest to us that investors could benefit from being more patient during such drawdowns.

Our Tactical Positioning

Around the trough of the COVID-19 sell-off in March 2020, the AAC gradually raised global equity exposure in its asset allocation positioning as market values moved lower. Some of these contrarian moves were early, others closer to the trough, but each of them reflected the committee's perception that value could be added in a dislocated market, even if the timing was not exactly correct.

In the most recent U.S. equity sell-off, the S&P 500 Index reached a 23.6% peak-to-trough decline on June 16, 2022. The market then rallied, with the S&P 500 rising almost 8% through August 31, 2022, but then declined again by 9.2% in the month of September. Through these moves, the AAC remained tactically underweight both U.S. and global equities. Key factors behind this relatively cautious approach included:

- Our perception that the Fed couldn't rescue the financial markets by cutting interest rates because it will need to continue fighting inflation.

- Although equities repriced to reflect higher interest rates, broad price/earnings ratios and other multiples only fell to near their historical averages—limiting perceived relative valuation opportunities.

- Corporate earnings estimates appeared optimistic in the committee's view, considering the risks of U.S. and/or global recessions and the potential downward pressure on profit margins.

In the AAC's view, these factors created enough uncertainty about how far we are from a true market bottom to justify a cautious approach, both before and after the June trough. However, the committee stands ready to increase equity exposure if it believes these conditions have changed.

We also would note that while stock and bond positioning often takes the headline, the AAC's approach to tactical allocation is considerably more nuanced than that. For example, the committee recently added duration⁵ by neutralizing a previous underweight to long-term U.S. Treasuries. As of September 30, 2022, the committee's positioning also featured tactical overweights in high yield and other "spread" fixed income sectors, where it believes that current yields and credit spreads⁶ provide adequate potential compensation for the perceived risks. The latter position highlights the importance of fundamental credit research in potentially helping to moderate the headwinds of a corporate credit cycle.

Conclusions

Estimating forward market returns is a very challenging task that requires investors to balance historical data and their assumptions about future market dynamics. Our original study found that raising equity allocations in significant market sell-offs typically

⁵ Duration measures a bond's sensitivity to changes in interest rates.

⁶ Credit spreads measure the additional yield that investors demand for holding a bond with credit risk over high-quality government securities with similar maturities.

enhanced returns irrespective of the precise timing. However, when we narrowed the analysis to the historical market drawdowns that most resembled the most recent one—featuring a combination of high inflation and rising and/or high interest rates—our conclusions became more nuanced and suggested a more patient approach.

We should note that T. Rowe Price does not have a single “house view” on these issues. While the AAC remains underweight stocks in its positioning,

some individual portfolio managers may be increasing equity exposure in their own strategies.

While the current environment warrants caution, in our view, we continue to believe that investors who increase their exposure to risk assets during market sell-offs potentially can enhance long-term portfolio returns. Accordingly, we will continue to monitor economic and market factors to identify potential opportunities to increase equity exposure as the cycle evolves.

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