

Stock Vulnerability and Resilience

A statistical method for predicting the relative vulnerability and resilience of stocks to market crashes

During the Covid-induced crash of 2020, the S&P 500 fell 34%.¹ However, below the surface, there was significant dispersion in individual stock performance. In fact, the best performing stock ended up 14% over this period while the worst performing stock ended down 85%—a cumulative spread of 99%. In our recent paper, “Stock Vulnerability and Resilience,” we explore whether a stock’s unique attributes can offer clues as to its relative vulnerability or resilience to future market drawdowns. We use a statistical method—based on our award-winning research on predicting the business cycle²—that combines stock attributes in a nonlinear and conditional way.

The approach is both rigorous and intuitive. We consider a stock’s circumstances—reflected as popular factor attributes—and measure its similarity to two groups of stocks: Those that have proven vulnerable to past market drawdowns, and those that have proven resilient. To do this, we use a powerful statistic called the Mahalanobis distance. Then, we convert these distances into relative likelihoods. The result is a precise score, ranging from zero to one, indicating the relative probability that a stock will be vulnerable to future drawdowns, and another indicating the probability it will be resilient.

In a battery of out-of-sample tests, we find that these vulnerability and resilience scores are powerful predictors of relative stock performance during market drawdowns. Moreover, they are more predictive than any individual stock attribute or their linear combination. The key advantage of our approach is that the relative importance of each attribute changes depending on the circumstances of each stock.

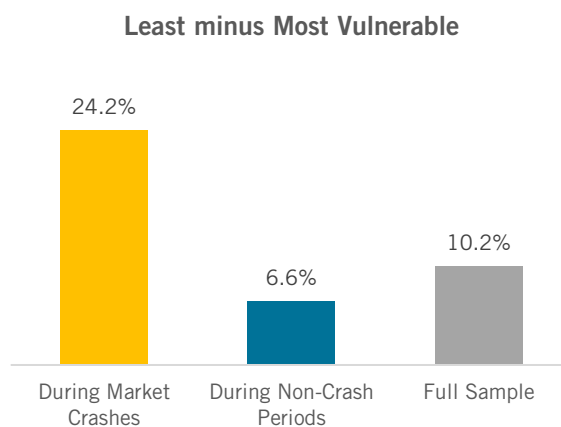
Moreover, as shown in Exhibit 1, we find that the least vulnerable stocks also outperform during non-crash periods. This suggests that investors may benefit from tilting away from the most vulnerable stocks in favor of their more resilient counterparts, even in the absence of timing crash events.

For more on this topic, see our 2023 journal article: “Stock Vulnerability and Resilience” by Megan Czasonis, Huili Song, and David Turkington, The Journal of Portfolio Management, Vol. 49, No. 5, April 2023.

¹ From February 19, 2020 through March 23, 2020.

² “A New Index of the Business Cycle,” by Will Kinlaw, Mark Kritzman and David Turkington (published in the *Journal of Investment Management* 2021) received the 2021 Roger F. Murray First Prize Award for research presented at the Q Group conference.

Exhibit 1: Average Portfolio Returns (Annualized, Out-of-Sample)




Beginning in 2009, at the end of each year, we form market capitalization-weighted portfolios from the 20% of stocks with the lowest vulnerability scores and the 20% of stocks with the highest vulnerability scores. Results cover the period January 2009 through December 2020. For more details, please refer to the paper cited below. Source: State Street Global Markets.

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