

Market Capitalization and the COVID-19 Stock Market Recovery



Introduction

On December 31, 2019, health officials in China formally acknowledge a string of pneumonia outbreaks located in the major industrial center Wuhan. The cause of the outbreak, then unknown, would soon be recognized as COVID-19, the virus responsible for the most severe global public health crisis in over a century. Its impact was swift, prompting nations across the world to enforce lockdowns, quarantines, and mandatory social distancing measures on a third of the world's population.

The economic implications of the COVID-19 pandemic were comparably just as severe. Beginning in late February 2020, as investors realized that the virus has taken root in Europe and North America, global stock markets crashed as fears of bankruptcies, closures, and mass unemployment permeated the economy. In the span of a month, the U.S. stock market lost about 30% of its value.

Surprisingly, global stock markets did not remain depressed for long. Despite the ongoing economic consequences of the COVID-19 pandemic, a combination of factors including fiscal and monetary policy responses, optimism in developing vaccines, and the adoption of remote work by several of the world's largest companies have mostly leaved investors' fears regarding the recession, resulting in an unprecedented recovery in equity values.

Why is this happening? Economists still can't agree on a concise explanation. One idea is that the recent outperformance of large, global companies is driving overall gains in the stock market while smaller, weaker companies have been largely left behind. The theory behind this idea is that larger companies are better positioned, financially and otherwise, to weather the storm until the global economy returns to normal. Smaller companies with less access to capital might be forced into bankruptcy. Therefore, the larger the company, the better the odds that it will survive the immediate crisis, and the more desirable it will be to investors.

Has market capitalization played a significant role in recent stock market performance, or is investor optimism unrestricted by such technical considerations? That is precisely what this report seeks to answer.

Data

I collected data on two measures of American equities, the S&P 500 Index and the S&P SmallCap 600 Index. The S&P 500 Index (SPX) is an index that tracks the performance of 500 publicly traded U.S. companies whose individual market capitalizations (market value of a company's total outstanding shares) exceed \$8 billion USD. In comparison, the S&P SmallCap 600 Index tracks public companies with a market capitalization between \$600 million and \$2.4 billion USD.

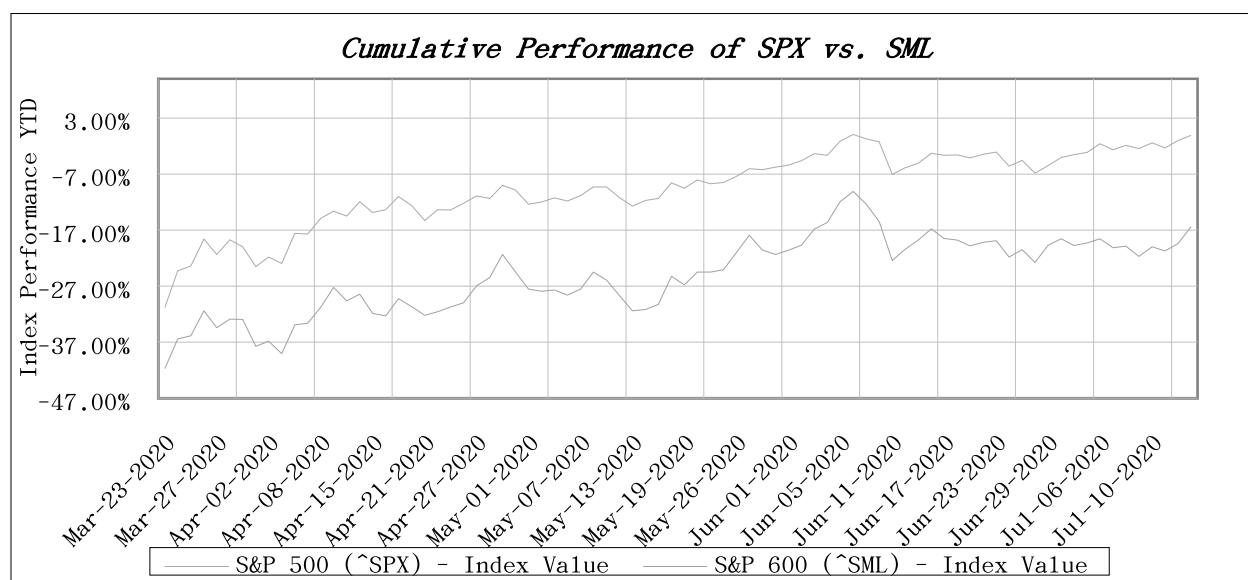
Market Capitalization: Comparison of SPX vs. SML Companies *(07/16/2020)*

| | S&P 500 (SPX) | S&P SmallCap 600 (SML) |
|--|---------------|------------------------|
|--|---------------|------------------------|

| | | |
|----------------|-----------------|---------------|
| <i>Average</i> | \$56.9 billion | \$1.2 billion |
| <i>Median</i> | \$22.6 billion | \$990 million |
| <i>Total</i> | \$28.4 trillion | \$723 billion |

The values of each index are controlled by the stock prices of their constituent companies, which themselves are influenced by a myriad of competing factors (macroeconomic cycles, company profitability, geopolitical risk, etc.). Despite the best attempts of stock traders in proving otherwise, stock price fluctuations have long been known to be inherently random, thus making the future values of the indices impossible to predict.

On March 23, 2020, both indices hit their lowest points as global stock markets suffered the worst crash since the Great Recession. Since then, both indices have made a slow but steady recovery.



A summary of both indices' performance from their March 23 lows can be found in the table below.

Daily Performance Summary (03/23/2020 to 07/15/2020)

| | S&P 500 Index | S&P SmallCap 600 Index |
|---------------------------|---------------|------------------------|
| <i>Mean</i> | 0.4895% | 0.5101% |
| <i>Median</i> | 0.5023% | 0.7778% |
| <i>Lowest</i> | -5.8944% | -8.2076% |
| <i>Highest</i> | 9.3830% | 9.0059% |
| <i>Standard Deviation</i> | 2.2648% | 3.3263% |
| <i>Kurtosis</i> | 3.53 | 0.23 |
| <i>Skewness</i> | 0.73 | 0.06 |

Hypothesis

The hypothesis is as follows: have large companies outperformed small companies during the stock market recovery? The null hypothesis is that neither index has outperformed the other, thus making their respective performance means equal.

$$H_0: \mu_{large} = \mu_{small}$$

$$H_a: \mu_{large} \neq \mu_{small}$$

An unpaired two sample t-test was run against the data. A significance level of 0.05 was chosen, thus making the critical value of the t-test ± 1.97 .

$$t = \frac{\bar{x}_{large} - \bar{x}_{small}}{\sqrt{s^2 \left(\frac{1}{n_{large}} + \frac{1}{n_{small}} \right)}} = -0.05$$

Since -0.05 is within the range of $-1.97 < t < 1.97$, it appears as if both indices performed relatively equally during the period in question. Additionally, the two-tailed p-value is 0.9638, further weakening the argument that either index outperformed the other. Therefore, the null hypothesis failed to be rejected.

Summary

The U.S. stock market mounted an unprecedented recovery from its March lows through July, seemingly against all odds. Is this optimism limited to large cap stocks? Based on statistical evidence collected from March through July on large-cap and small-cap stocks, I can conclude that market capitalization has *not* played a significant role in stock market performance.