A Study on Wealth Management During Crisis : An Empirical Study Using Downside Risk Approach in India

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Abstract

Purpose : The present study identified the factors influencing shareholders' wealth during a crisis like COVID-19. The growing importance of the capital asset pricing model (CAPM) in shareholders' minds leads to identifying new important factors that ruin wealth during a downturn. Hence, the present study is a humble attempt to find such a factor identified as downside beta.

Methodology : The main independent factor, namely market risk premium, is very popular as CAPM of equity returns. The importance of protecting wealth becomes more important than creating wealth. This leads to considering only downside market movement to understand equity returns in the current study. Furthermore, a proposed model was introduced as Downside CAPM (D-CAPM). D-CAPM structural changes were captured during COVID-19 by taking data from April 1, 2019 – March 31, 2020, and April 1, 2020 – March 31, 2021.

Findings : We found that the slope of the relationship relatively showed more sensitivity to downside movement. However, individual stocks' slope of relationship improved after COVID-19. It showed improved return sensitivity after the COVID-19 scenario, even when the market turned negative.

Practical Implications : The outcome of this study will aid investors, investment advisors, portfolio managers, and others in protecting and managing their wealth even during a crisis using the DCAPM method.

Originality : Unlike prior research on D-CAPM, this study attempts to capture structural changes in the model during COVID-19 in India.

Keywords : wealth management, COVID-19, DCAPM, India, NIFTY50

JEL Classification Codes : G10, G11, G15

In the era of financial economics, the efficiency of the stock market is a debated subject matter. An accurate stock valuation is essential for investors, analysts, managers, and researchers. They are trying to value the firms and become aware of undervalued shares for investment purposes. However, to manage the wealth of investors and stakeholders, the capital assets pricing model (CAPM) came into effect and did a pioneer study for calculating an expected return rate propounded by Sharpe (1964). The CAPM model has been widely examined both empirically and theoretically. However, no inevitable conclusion has been drawn, but still, the anomalies evidence that refutes CAPM cannot be denied. CAPM was itself one puzzle that was solved partially. For over 30 years, practitioners and academics have debated the merit of CAPM and concentrated on whether beta is suitable for measuring risk.

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Further, Fama and French (1992) extended CAPM by contributing two new factors and described the blend size factor and book-to-market factor. Furthermore, it supports the relationship between size, book-to-market value, and stock return. After the availability of well-known CAPM and Fama - French (FF) three-factor models; still, investors cannot maintain their wealth during a crisis like the Lehman Brothers 2008 and COVID-19. The economy has suffered greatly as a result of the crisis. According to Ji et al. (2020), the global financial system experienced extreme turbulence and danger during COVID-19. Investors need to be cautious while selecting stocks from the market. Every investment opportunity involves some risk and return. During COVID-19, the world economy was affected negatively and badly by trade, the supply of food, and tourism. The attack of coronavirus has shaken the financial system, which may lead to another crisis revealed by WHO.

However, Roy (1952) proposed two ideas to manage wealth and maintain the financial system. The first is downside risk, which is important to investors. Second, securities distributions cannot be evenly distributed; thus, assessing a downside risk can aid investors in making informed choices when faced with an evenly distributed security return. Hence this study will aid investors, fund managers, investment advisors, and portfolio managers in managing their wealth using the DCAPM method in recent times like the COVID-19 crash.

Literature Review

As discussed earlier, the economic outcome has been dramatically affected by the outbreak of COVID-19, which resulted in major losses for most financial markets worldwide. According to Carp (2012), economic progress may delay because of market failure vulnerability in crisis. Contingency effects generally decline the forecast and anticipation. This includes a thorough analysis of past events to look for specific patterns or recommendations for action that will be taken in the future. Risk is inevitable and required to produce a substantial profit to sustain the financial market. However, investors are never worried when the returns are positive; if the returns are adverse, it substantially impacts investors and the economy's functioning.

The theory of CAPM has generated a substantial body of literature, where Jensen et al. (1972) and Fama and MacBeth (1973) showed that beta elucidates the cross-section of stock returns. While Aggarwal (2017), Anwar and Kumar (2018), Kayo et al. (2020), and Rabha and Singh (2022) focused on the CAPM model, they found no conclusive sign of a cross-sectional relationship between beta and returns. Many researchers have utterly discredited the single factor CAPM, and some of them claimed that the extended CAPM has oddities (multifactor CAPM). The importance of defining, identifying, and evaluating risk for investors is made clear through careful analysis.

Although this assumption was debatable, the theoretical context of the CAPM undertakes that investors give equivalent weightage to each upside risk and downside risk. Additionally, it has been suggested that investors are willing to pay more for stocks with upward potential during bull markets. The primary concern of investors is downside protection in bearer markets with the highest degree of safety and care, according to Girardi and Ergün (2013), Reboredo and Ugolini (2016), Shahzad et al. (2018), and Bouri et al. (2020).

Ayub et al. (2020) additionally stated that in a developing market like India, the downside risk-based (DCAPM) performs well than the variance-based CAPM. Hence, this study has also assessed the DCAPM model in emerging markets (India). Due to COVID-19, India and many other countries have suffered losses. This study will make clear the importance of the downside-based (DCAPM) method by assessing pre-COVID-19 and post-COVID-19 data.

Research Methodology

This empirical and descriptive study describes downside risk through the semi-variance concept. This study tested the D-CAPM on single constitutional stocks of return following Estrada (2002).

$$Re - Rf = \alpha + \beta drp * Min((Rm - Rf), 0) \qquad (1)$$

where,

Re = Expected returns on equity stock,

Rf = Risk-free interest return,

Rm = Returns on a market-diversified portfolio,

βdrp = Slope of relationship during downside risk premium.

Data Selected

In this study, pre-COVID and post-COVID adjusted closing price has been computed from Yahoo Finance from April 1, 2019 – March 31, 2020, and from April 1, 2020 – March 31, 2021, respectively. The main impact of COVID-19 was observed in March 2020, the first lockdown period in India. Hence, a given timeline was required to understand the impact and how DCAPM structural changes took shape. Each constitutional stock of Nifty50 adjusted return was calculated through adjusted prices taken from yahoo finance. For further analysis, the MRP has been collected from the IIMA library and calculated DRP by the below-given formula :

$$DRP = Min(MRP, 0) \qquad (2)$$

Hypothesis development for Pre-COVID:

ᗠ **H01 :** DRP does not significantly impact the expected risk premium of each constitutional stock of Nifty50.

Hypothesis development for Post-COVID:

ᗠ **H02 :** DRP does not significantly impact the expected risk premium of each constitutional stock of Nifty50.

Pre-COVID and Post-COVID hypotheses were checked for each listed stock of Nifty50 regressions in R studio using regression loop coding to generate the final result summary, which is mentioned and explained in the next section. The results of 100 regressions (50 pre and 50 post-COVID-19 DCAPM models) briefly show model fit, model summary, and coefficient summary to understand DPR's significance in DCAPM models. Thereafter, paired t-test was performed to check the impact of COVID-19 on structural changes of DCAPM, Beta explanation in the model, and returns on each stock using R studio.

Analysis and Results

Table 1 shows a summary of pre-COVID and post-COVID DCAPM model results for each stock of NIFTY50. It clearly depicts that out of 50 constitutional stocks of NIFTY50, only 49 stocks show the DCAPM model and DPR factor significance. Hence, hypotheses H01 and H02 are rejected for 49 stocks, only failing to reject one stock, namely Infosys Ltd. Pre and Post, in both cases, only Infosys showed no impact of downside risk premium. Overall, 33.75% of the variation is explained by the DPR factor before COVID. However, this explanation is reduced to 18.21% post-COVID. The slope of the relationship Beta DPR is also reduced. So basically, the downside risk is more relevant during the pre-COVID situation, and after any crisis, this downside risk becomes irrelevant.

In the future, any such disaster situation may make downside risk a very important factor. Long-term

Table 1. *Summary of DCAPM Results*

COVID	DPR Significance	Non-Significance	Mean R Square	Mean Alpha	Mean Beta
Pre-COVID	49	1	33.75%	1.2805	0.5688
Post-COVID	49	1	18.21%	1.6372	0.4162

investment needs to be protected through the proposed model. However, in normal circumstances, using DCPAM instead of the CAPM model may not be relevant.

This study performs a paired *t*-test with the following hypotheses to understand the significant difference.

✧ **H03 :** There is no significant difference in the slope of the relationship between the individual stock returns and DPR for the pre-COVID and post-COVID situations.

✧ **H04 :** There is no significant difference in the variance explanation of stock returns by DPR for the pre-COVID and post-COVID situations.

Table 2 summarizes paired *t*-test results for R - square and beta differences for pre and post COVID-19 scenarios for DCAPM models. Hypotheses 3 and 4 are both rejected and show significant differences. As shown in Table 2, the percentage explained variance reduced post-COVID significantly ($p<0.05$). In fact, DPR is less relevant by 15.55% overall to individual stock variation. But overall, the slope of the relationship relatively shows more sensitivity to the downside movement. However, individual stocks' slope of relationship improved after COVID-19. It shows improved return sensitivity after the COVID-19 scenario, even when the market turns negative.

Table 2. *Paired t-Test for 50 Stocks Using DCAPM Models*

Pair	Mean Difference	*t*-value	*p*-value
Pre Beta-Post Beta	–0.357	–7.853	0.000*
Pre R Square-Post R Square	0.1555	12.278	0.000*

Note. * 5% significance.

Implications and Conclusion

During COVID-19, almost every industry suffered due to the sharp drop in domestic demand and exports, with some prominent outliers seeing considerable growth. Not only COVID-19, but even other uncertain events destroy investors' wealth due to a sharp fall in equity valuations. Hence, it is very important to consider the DCAPM in selecting stocks in the portfolio in such a situation. The outcome of this study will aid investors, investment advisors, portfolio managers, and others in protecting and managing their wealth even during a crisis using the DCAPM method. Of course, once the crash and crisis are over, downside risk becomes less relevant, and one can reconstruct the portfolio for better returns. This can further lead to another possible research to explore understanding upside movement with downside movement for any equity stocks.

Limitations of the Study and Scope for Further Research

This study focuses on COVID-19 downfall only, which may not give the generalized acceptance of the model for

any downfall. Hence, another downfall like the Lehman Brothers can be covered in the future to provide more strong evidence of DCAPM model accuracy. Another notable limitation is that this study only explores the direct and linear relationship of downfall with a market risk premium. There may be other factors also that can be added to give more explanation to how the equity market creates returns for the investors. Due to time constraints, the study focused only on the Indian context. By adding a multi-country analysis, this DCAPM model may give better insights into the importance of protecting investors' wealth during the downfall.

Authors' Contribution

Dr. Abhishek Parikh conceived the idea and developed qualitative and quantitative designs for the empirical study. Divya Kumari extracted research papers with high repute, filtered these based on keywords, and prepared the introduction and literature to the study design. Dr. Abhishek Parikh verified the analytical methods and supervised the study. Divya Kumari did the data collection. The numerical computations were done by Dr. Abhishek Parikh using SPSS 16.0 and R Studio. Ms. Divya wrote the manuscript in consultation with Dr. Abhishek Parikh.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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