Did Indian Equity Mutual Funds Use Derivatives to Hedge Their Exposure During COVID?

Jaishankar Krishnamurthy [1]
Satyendra Pratap Singh [2]

Abstract

Purpose : The study examined the use of derivatives by mutual funds (MFs) to manage risks during COVID-19. We analyzed data of all MFs (excluding Arbitrage Funds) with equity exposure from the NAV, India database.

Methodology : The authors reviewed over 500 equity MFs with assets under management of INR of 15 lakhs crores. They analyzed the derivative holdings of MFs from January 2019 to December 2023 to study the use of derivatives during pre-COVID, COVID-19, and post-COVID periods. The review examined which MFs used derivatives to hedge exposure and their performance versus their peers and benchmarks. The methodology used was the *t*-test, *F*-test, Levine's test, and ANOVA.

Findings : The results revealed that the fund managers did not hedge a significant portion of their portfolio. The analysis revealed that the derivative holdings by fund managers decreased significantly during COVID-19 and increased after the end of the pandemic. MFs with derivatives holdings of more than 2% of the portfolio did not beat the benchmark indices. However, MFs that used derivatives had lower variance than their respective benchmark, providing higher returns for the same level of exposure to risk.

Practical Implications : The research provided valuable insights into how equity MFs utilized derivatives to hedge their exposure for investors, fund managers, and regulators, as well as highlighting the potential risk-reduction benefits of this strategy.

Originality : This was the first study on the use of derivatives by Indian Mfs.

Keywords : **derivatives, COVID-19, mutual funds, risk management, investment management**

JEL Classification Codes : G10, G11, G23

Paper Submission Date : April 15, 2024 ; Paper sent back for Revision : October 24, 2024 ; Paper Acceptance Date : November 10, 2024

A mutual fund (MF) is a collective investment plan that is professionally managed and pools money from numerous individuals to invest in assets like stocks, bonds, short-term money market instruments, and other financial instruments (Rehmani, 2018). Investors prefer Mfs for several reasons. Purchasing shares directly from the market is one way to invest. Achieving this, however, requires research into the firm's track record whose shares are being bought, the company's future business strategies, the promoters' résumé, the company's dividend and bonus issuance history, etc. MFs have gained immense importance in recent years mainly because they offer an effective, low-cost way for investors to contribute to financial markets while spreading risks through portfolio diversification. They are crucial for the financial sector, in particular, and also play an essential role in the overall growth of the capital market in India. The combined assets managed by MF houses are over INR 43 lakhs crores.

[1] *Research Scholar (Corresponding Author),* Alliance School of Business, Alliance University, Anekal, Bengaluru - 562 106, Karnataka. (Email : kjaishankarPHD23@bus.alliance.edu.in)
[2] *Professor,* Alliance School of Business, Alliance University, Anekal, Bengaluru - 562 106, Karnataka. (Email : satyendras.14@gmail.com)

DOI : https://doi.org/10.17010/ijrcm/2024/v11i4/174728

COVID-19 was a significant shock to worldwide stock markets, and the Indian stock market suffered, with the major indices NIFY50 and Sensex falling by almost 40% within two months from their peak in January 2020. Leading MFs also bore the brunt of witnessing similar/ higher erosion of the Net Asset Value during the same period, which could have been lessened if the MFs had used derivatives to hedge the exposure. MFs can utilize derivatives as a hedge by the SEBI, provided that the cumulative gross exposure from debt, equity, and derivatives does not surpass 100% of the scheme's net assets (Circular Number: Cir/IMD/DF/11/2010). The SEBI updated its circular in January 2019 to allow MF schemes (other than ETFs and index funds) to write call options on constituent stocks of the Sensex indices and Nifty 50 only using a covered call strategy. The notional value of the call options issued by a plan, including the strike price and premium value, maybe 15% of the equity shares' overall market value owned by the plan. "The total number of shares supporting all written call options cannot exceed 30% of the overall number of unencumbered shares of a certain business owned in the plan (Circular No.: SEBI/HO/IMD/DF2/CIR/P/2019/17)."

Retail investors could trade derivatives via MFs instead of using their accounts for various reasons. There are entrance obstacles for small investors, particularly for currency derivatives contracts and interest rates, which are frequently too big for most retail investors. Retail investors might not be well-informed on derivatives and how they are used, and they could also choose not to take personal risks (Johnson & Yu, 2004). According to the SEBI study in 2023, 89% of individual traders (i.e., 9 out of 10 individual traders) in the equity derivatives segment suffered losses. Additionally, MFs benefit from scale economies in their transactions and in the costs they incur. Liquidity restrictions may be placed on small investors by contracts that demand daily marking to market.

Derivatives are used extensively by Arbitrage MFs (which hedge 100% of their exposure) and by debt funds to manage against interest rate risk. We examined the utilization of derivatives by equity, hybrid, and other funds with significant equity shares investments. By undertaking this research, we can derive insights on this unexplored topic. While derivative volumes have been growing by leaps and bounds due to continued interest from retail investors and FPOs, our study examines their use by Indian MFs. By reviewing the data from 2019 to 2023, we have analyzed the decisions made by MFs during the critical period of COVID-19, comparing their holdings pre-, during, and post-COVID. Our analysis revealed that the total holdings in derivatives as a percentage of total investment by all equity funds is insignificant. This is significant as an instrument permitted to reduce the risk from unanticipated global or domestic events is not being used. This observation is stark in the face of a global pandemic like COVID-19, during which stocks fell over 40%, leading to a similar decline in most MFs and creating stressful times for retail investors. To the relief of investors, the market has turned around and has now touched all-time highs. However, the question of why equity fund managers avoid using derivatives to hedge their market exposure remains unanswered. Is it because of the restrictions placed by SEBI, wherein an MF can only hedge its exposure, which will result in lower performance during bull markets? Another reason could be the cost of hedging due to the availability of only short maturities in the derivatives market. The study on hedging becomes equally important as, according to a report released by Morgan Stanley, the Indian stocks could fall by 25–40% if the current government is not re-elected. Only some funds have investments in derivatives of 2–15% of their portfolio.

Our analysis also provides information on the types of derivatives, i.e., Stock future, Index future, Index Call and put option, stock call and put option, and derivatives of commodities. Our analysis reveals that, despite SEBI approving MFs to invest in options, they primarily invest in index and stock futures. Our analysis also revealed that the disclosure on the holding of derivatives by MFs in their portfolio is not uniform, as some funds show short positions as positive figures in their holdings on account of the margin place, while few others report short positions as unfavorable while reporting their exposure to derivatives. This is a crucial insight for the regulator SEBI to ensure that all MFs utilize a uniform approach to report their derivative exposure.

Literature Review

While there have been many studies on the Indian equity fund's performance, there is limited research on the derivatives usage by Indian equity MFs. Our literature review mainly covers studies across the Globe on the usage of derivatives by MFs and select studies on the Indian markets. The most conclusive evidence to date comes from a study of MFs by Koski and Pontiff (1999), which indicates that most MF managers utilize derivatives for hedging and that a tiny percentage utilize them for speculating and amplification. The use of derivatives may have advantages, according to an earlier study. According to various studies by Almazan et al. (2004), Deli and Varma (2002), Frino et al. (2009), and Koski and Pontiff (1999), benefits could include improved information use, lower costs of the transaction, lower costs of liquidity-motivated trading, and more effective ways to maintain a certain level of the risk exposure. Cao et al. (2011) found that risk along with return characteristics of funds that utilize derivatives are significantly dissimilar from those of the funds employing derivatives sparingly.

Mandal (2011) analyzed the hedging effectiveness of stock index futures and found that using LLS models to hedge portfolios can reduce risk. Based on an argument first put forth by Glode (2011), a logical conjecture that explains the observed underperformance and extra flows is that the derivative strategies used by these funds may have been designed to outperform during times of crisis when investors place a premium on a solid performance. The managers of Canadian MFs do not use derivatives in their holdings (Johnson & Yu, 2004). According to a study on Spanish MFs, using derivatives does not increase the funds' performance (Marin & Rangel, 2006). It was discovered that the average asset allocation to derivatives grew by about 50% throughout this period, closely corresponding with the management of Italian MF legislation to European norms. A study on the usage of options by US-based MFs found that neither permanent nor transient users of options engaged in excessive risk-taking, but rather that certain funds used options to reduce risk successfully (Cici & Palacios, 2015).

During the first outbreak, funds that utilized derivatives for the hedging prior to the crisis substantially outperformed nonusers by over 9% as their derivative return's distribution shifted to the right (Kaniel & Wang, 2022). Derivative users considerably improved their risk-adjusted performance, increased their exposure to market risk, decreased idiosyncratic and overall risk, decreased skewness, and raised kurtosis during the same period. Kaniel and Wang's (2022) most recent analysis, which used new data, discovered that almost 30% of US MFs employ derivatives, even though there is now little proof of a connection between fund performance as well as derivative usage.

Several studies have examined the COVID-19 impact on mutual allocation, company performance, and investor preferences. According to Bansal et al. (2020), Indian companies with more significant cash balances performed better than similar competitors with less financial flexibility. Ramelli and Wagner (2020) draw similar conclusions on the importance of financial flexibility in the US. Our results on US institutional investors' trading preferences also support those of Glossner et al. (2020).

Objectives, Data, and Methodology

The study's objectives are as follows:

- To determine whether equity MFs' use of derivatives increased/decreased during COVID-19.
- To determine whether the equity MFs' that use derivatives outperformed their peers pre-, during, and post-COVID-19.
- Did investment in derivatives assist equity MFs' in reducing their volatility and improving their overall performance based on risk/return matrices?

The authors reviewed over 500 equity MFs with assets under management of INR 15 lakhs crores. They reviewed the derivative holdings of mutual funds from January 2019 to December 2023 to study the use of derivatives pre-COVID, during COVID, and post-COVID periods to examine which MFs used derivatives to hedge exposure and their performance versus their peers and their benchmarks.

There is vast scholarly research on evaluating Indian MF performance. Sapar and Madava (2003) used risk-return analysis, the Sharpe ratio, Jensen & Fama, Treynor ratio, and other methods to determine the Indian MF sector performance during the bear market. From September 1998 to April 2002, AMFI provided statistics on monthly closing NAV. For the study, a sample of 58 open-ended designs was selected. The study's conclusions showed that the majority of the sample schemes could provide better returns than predicted returns in terms of both total and systematic risk. Devi and Kumar (2010) evaluated the investment performance of equity MFs within India from 2003 to 2007 using mean rate of return, Standard Deviation (*SD*), and risk-return analysis.

Furthermore, risk-adjusted performance assessment measures like the Treynor, Sharpe, and Jensen measures were also used. A total of 102 schemes were taken as sample schemes: 56 equity diversified funds, 18 equity tax saving funds, 21 equity index funds, and seven equity technology funds. Comparing the investment MFs' performance from India's public and private sectors, these research findings showed no discernible difference. We analyzed the performance using the rate of return, Treynor & Sharpe ratios, *SD*, and beta. Dhanda et al. (2012) analyzed the investment performance of a few open-ended MF plans in terms of risk-adjusted returns and risk-return from April 2009 to March 2011. The findings revealed that only three schemes, HDFC Capital Builder Fund, HDFC Top 200, and UTI Opportunities Fund, outperformed the market.

Zaheeruddin et al. (2013) examined three private-sector MF performances from July 1, 2009, to April 2, 2012. Besides risk-return analysis, risk-adjusted measures of performance analyses like Sharpe &Treynor ratios and Jensen Alpha have also been utilized to assess performance. The research findings indicated that ICICI generated the highest returns, whereas Birla Sun Life was the riskiest. Pal and Chandani (2014) attempted to investigate the performance of the top 10 equity MF plans for a period of 5 years, that is, from 2007 to 2012. With the statistical measures like *SD*, *R*-square, beta, expense ratio, and Sharpe ratio, the analysis revealed that among all the sample schemes, HDFC Mid Cap Opportunities and Quantum Long Term Equity emerged as top performers during the study period. Goyal (2015) compared the performance of the top 10 MFs with that of the CNX Nifty and S&P benchmark indices. The research discovered that all of the schemes generally worked well since they produced greater and better returns than the market index utilizing the Treynor ratio, Sharpe ratio, and Jensen measure. Franklin India Opportunities Fund has been determined to be the top performer among all the sample schemes since it produced greater average returns while also having reduced risk.

Measures Used for Performance Evaluation

Return Measures

Investments are made to earn a reward. Returns may be defined as the reward earned from an investment. Monthly returns of the selected MF schemes were calculated with month-end NAVs by utilizing the formula mentioned below:

$$R_{pt} = \frac{NAV_t - NAV_{t-1}}{NAV_{t-1}}$$

where, R_{pt} = fund returns, NAV_t = NAV current day , NAV_{t-1} = NAV in previous day.

Likewise, the benchmark index return was computed as:

$$R_{mt} = \frac{index_t - index_{t-1}}{index_{t-1}}$$

where R_{mt} represents the market return, $index_t$ and $index_{t-1}$ present the market index on day t and the previous day.

Risk Measures

Investments are risky. Risk may be defined as the potential for variability in returns. Risks are neither good nor bad. Risk in an investment usually refers to the probability that the actual returns may be less than expected. The higher the risk in an investment, the higher its returns. There are two types of risks: total risk, measured by *SD*(σ), and systematic risk, determined by beta coefficient (β). The risk involved with the chosen MF schemes has been determined based on month-end NAV.

The research has used the following risk measures:

Standard Deviation (σ)

It measures return volatility since it compares the actual returns of an MF to its predicted returns. Higher *SD* indicates higher risks involved in the investment.

Beta (β)

Beta (β) measures the volatility in returns of an investment in terms of systematic risk and is calculated by relating the portfolio returns with the market returns.

Risk-Free Rate

It has zero variability of returns, is not associated with risky assets, and serves as the baseline for the performance evaluation of risky investments. In the present work, the average monthly yield of 91 days of treasury bills has been considered a risk-free rate, particularly because it is guilt-edged and, of course, because of its easy accessibility.

Sharpe Ratio

Sharpe (1966) constructed an index to measure portfolio performance. It is recognized as a reward-to-variability ratio. It is the excess return ratio average of fund portfolios and the *SD* of the returns in a given period. It measures the return on the portfolio's total risk and is based on the Capital Market Line (CML). Sharpe ratio judges the efficacy of fund managers in the diversification of overall risk and is a beneficial tool to assess the excess return/unit of overall risk. It is believed that the greater the Sharpe ratio, the better it is.

Treynor Ratio

Treynor (1965) gave another measure of performance evaluation, popularly known as the Treynor ratio. It is pretty similar to the Sharpe ratio as it also determines excess returns created by an investment over the risk-free rate. The Treynor ratio evaluates excess returns per unit of systematic risk, i.e., beta, unlike the Sharpe ratio, which uses total risk. It is also recognized as the ratio of reward to volatility. Similar to the Sharpe ratio condition, the larger the "Treynor ratio," the better it is.

Jensen Measure

Jensen (1968) developed another methodology to measure the average return of a fund portfolio (above or below) as predicted by the Security Market Line (SML). It is popularly referred to as Jensen's alpha. This methodology is beneficial as it assesses the fund managers' capability to make higher returns for investors. A positive and significant Jensen alpha value indicates that the fund has generated higher returns than CAPM returns.

Analysis and Results

We downloaded the data of derivative holdings for the period from January 2019 to December 2023, and the results are shown in Figure 1.

It is clear from the above chart that the total derivative holding decreased significantly between pre-COVID and during COVID and started increasing slowly post-COVID. To check the robustness of our assessment, we did a *t*-test to compare the mean of derivative holdings from January 2019 to December 2019 (pre-COVID) with January–December 2020 (During COVID). Similarly, the results are given in Table 1 for the following years. The results establish that the derivatives volumes decreased significantly when the market started declining due to fears over the pandemic. Except for 2023, the downward movement in 2020 and the upward movement in 2021 and 2022 are statistically significant.

Figure 1. ***Derivative Holdings of Indian Equity Mutual Funds***

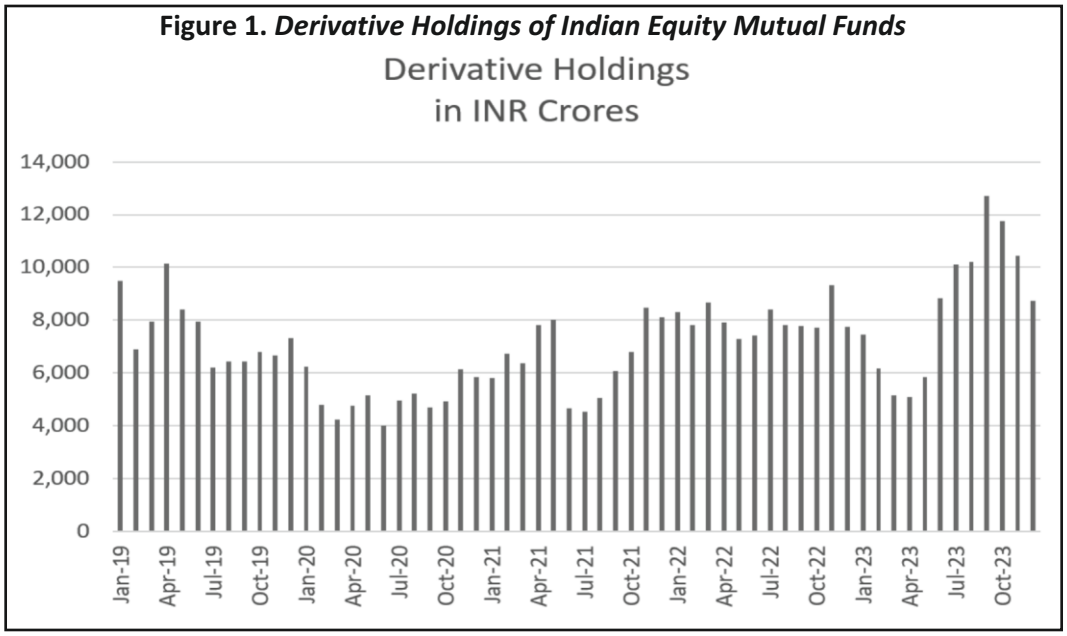

Table 1. ***t-Test of Derivative Holdings***

Year	Derivative volume in Crores	*t*-test, *p*-value
2019	7555.98	
2020	5070.52	0.0001
2021	6539.4	0.0019
2022	8016.27	0.0039
2023	8541.87	0.5022

Table 2. ***Break-Even of Derivative Holdings***

Description	2019	2020	2021	2022	2023
Derivatives	18.7%	51.4%	38.3%	43.0%	36.0%
Derivatives - Index Call Option	0.0%	0.0%	0.0%	0.0%	0.0%
Derivatives - Index Future	6.3%	10.1%	14.6%	3.6%	1.4%
Derivatives - Index Put Option	0.1%	0.7%	0.8%	1.8%	1.0%
Derivatives - Stock Call Option	0.0%	0.0%	0.0%	0.1%	0.3%
Derivatives - Stock Future	74.9%	37.8%	46.3%	51.3%	56.4%
Derivatives - Stock Put Option	0.0%	0.0%	0.0%	0.1%	0.0%
Derivatives - Commodity	0.0%	0.0%	0.0%	0.0%	4.8%
Grand Total	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2 shows the breakdown of derivative volumes into several categories that we compiled. The figures corresponding to the first line of the table below are the cash margin placed by MFs with the exchange for trading in derivatives. We can clearly see similar results with the figure for derivatives of stock futures falling by almost 50% during COVID-19 and rising by 50% post-COVID-19.

Table 2 shows that MFs must utilize the ease-in rules issued by SEBI in 2019, as the volume of holdings in options is relatively small. We spoke to a few fund managers, who advised that they have been trying to manage their funds during this roller coaster ride and have yet to invest in options. However, they feel that the volumes will increase in the future.

We selected 10 MFs that had an average holding over 2% of the average of the total derivative holdings during the period from January 2019 to December 2023, and their names are given in Table 3. Descriptive statistics of the funds are given in Table 4.

Table 3. ***Top Ten Mutual Funds with Highest Derivative Holdings***

Name of the Fund	Scheme Size in INR Crores as of December 31, 2023
Aditya Birla SL Frontline Equity Fund (G)	21,840
AXIS Bluechip Fund (G)	34,580
ICICI Pru Bluechip Fund (G)	47,928
ICICI Pru Multi-Cap Fund	10,340
Parag Parikh Flexi Cap Fund - Direct (G)	52,007
Quant Active Fund (G)	7,413
Quantum Mid Cap Fund	4,222
Quant Flexi Cap Fund (G)	2,901
Quant Small Cap Fund (G)	13,001
SBI Magnum Global Fund (G)	4,253

Table 4. ***Descriptive Statistics of the Mutual Funds***

Scheme Name	Base Date	5 Years CAGR	Annualized *SD*	Annualized Sharpe Ratio	Treynor Ratio	Jensen's Alpha
Aditya Birla Equity Fund	Dec-23	14.93	18.00	0.71	0.06	0.00
AXIS Bluechip Fund (G)	Dec-23	13.65	12.40	0.82	0.07	0.01
ICICI Pru Bluechip Fund	Dec-23	16.98	17.79	0.82	0.06	0.01

ICICI Pru Multi-Asset	Dec-23	18.29	13.53	1.11	0.10	0.03
Parag Parikh Flexi Cap	Dec-23	22.79	14.42	1.31	0.13	0.05
Quant Active Fund (G)	Dec-23	26.22	20.06	1.13	0.11	0.05
Quant Flexi Cap Fund (G)	Dec-23	26.60	19.41	1.18	0.12	0.05
Quant Mid Cap Fund (G)	Dec-23	26.82	22.04	1.02	0.08	0.03
Quant Small Cap Fund	Dec-23	32.22	21.31	1.30	0.15	0.07
SBI Magnum Global Fund	Dec-23	15.64	13.75	0.92	0.09	0.02
Average		21.41	17.27	1.03	0.10	0.03
Scheme: Indices						
Nifty 200 TRI	Dec-23	16.74				
S&P BSE 500 TRI	Dec-23	19.75				
S&P BSE 200 TRI	Dec-23	17.20				

Table 5. ***Average Monthly Returns of Mutual Funds and Major Benchmarks***

Fund Name	Average Daily Returns*
Aditya Birla SL Frontline Equity Fund (G)	0.0631
AXIS Bluechip Fund (G)	0.0583
ICICI Pru Bluechip Fund (G)	0.0708
ICICI Pru Multi-Asset Fund (G)	0.0719
Parag Parikh Flexi Cap Fund - Direct (G)	0.0912
Quant Absolute Fund (G)	0.0859
Quant Active Fund (G)	0.1022
Quant Flexi Cap Fund (G)	0.1290
Quant Small Cap Fund - (G)	0.1203
SBI Magnum Global Fund (G)	0.0904
Average	**0.0883**
Nifty 200 TRI	0.0756
S&P BSE 500 TRI	0.0730
S&P BSE 200 TRI	0.0709
Nifty Large Midcap 250 TRI	0.0756

Note. *For five years, from 2019 to 2023.

We calculated the daily average returns of the 10 MFs mentioned above for the period from January 1, 2019, till December 31, 2023, and of select benchmarks and results are given below in Table 5.

The authors did a *t*-test using daily returns and found that there was an insignificant difference in means between the indices and mean returns of the MFs investing in derivatives, as shown in Table 6.

We also did an *F* test to compare the variances between the average daily returns of mutual funds that invest in derivatives against the indices. Table 7 shows the substantial difference we discovered.

This perhaps explains the high Sharpe ratio, positive Treynor ratio, and Jenson's alpha. We also did Levine's test for homogeneity and ANOVA, and the statistics are given in Table 8.

Table 6. ***Results of the t-Test Comparing Means***

***t*-Test : Paired Two Sample for Means**		
	Variable 1	**Variable 2**
Mean	0.086044949	0.072962727
Variance	0.914180339	1.79103125
Observations	1,232	1,232
Pearson Correlation	0.077456913	
Hypothesized Mean Difference	0	
df	1,231	
t Stat	0.290008581	
P(*T* < = *t*) one-tail	0.385929257	
t Critical one-tail	1.646092395	
P(*T* < = *t*) two-tail	0.771858515	
t Critical two-tail	1.961892958	

Table 7. ***Results of F- Test Comparing Variances***

***F*-Test Two-Sample for Variances**		
	Average Returns of Mutual Funds	***S&P BSE 500 TRI***
Mean	0.085682364	0.072962727
Variance	0.880617247	1.79103125
Observations	1,232	1,232
df	1,231	1,231
F	0.491681676	
P(*F* < = *f*) one-tail	0	
F Critical one-tail	0.910466185	

Table 8. ***ANOVA and Levine Test for Variances***

Test of Homogeneity of Variances					
		Levine Statistic	***df*1**	***df*2**	**Sig.**
MF	Based on Mean	2.255	248	845	0.000
	Based on Median	1.252	248	845	0.012
	Based on the Median and with adjusted *df*	1.252	248	217.295	0.045
	Based on trimmed mean	2.138	248	845	0.000

ANOVA					
MF					
	Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
Between Groups	581.954	386	1.508	2.537	0.000
Within Groups	502.212	845	0.594		
Total	1084.166	1231			

Conclusion

The authors examine the derivatives utilization by Indian equity funds to hedge their exposure during COVID-19. We find a significant drop in derivatives volumes between pre-COVID and during COVID and a significant increase between during COVID and post-COVID, which reveals that MFs do not use derivatives to hedge their exposure. However, a sharp-up run in the market coinciding with an increase in derivatives indicates that the fund managers may be using derivatives to safeguard their profits in case of a drop in the market.

The authors conclude that the derivatives utilization by equity MFs does not assist in their efforts to beat benchmark indices. We find that the volatility, as calculated by the *SD* of returns, is significantly lower for MFs that invest in derivatives, positively affecting the Jensen's alpha, Sharpe, and Treynor ratio of mutual funds.

Our data analysis reveals that, as an industry, most Indian equity MFs invest insignificant amounts in derivatives. The authors speak with several fund managers on the reasons and are given the following reasons:

- ***High Transaction Costs :*** The Indian futures market's maturity is very short, with most trades happening within two months of maturity. If an MF decides to hedge its exposure using a NIFTY futures short position, it has to roll over every two months to be able to do so. This increases transaction costs and makes derivatives unattractive.

- ***SEBI Rules :*** As per SEBI guidelines, the fund's total exposure, including the derivative, should not exceed 100%. If an MF invests in derivatives of INR 1000, which will place a margin of 25% of INR 250, it must set aside INR 750 in fixed deposits. Since there is no benefit of leverage to MFs, as against individuals who can trade in margin, the MF houses restrict purchasing derivatives. The second reason is that MFs cannot short any stock and use only NIFTY contracts to hedge compared to foreign institutional investors, who can hold long on specific equities and short on others.

Implications

The research's managerial implications are that it provides valuable insights into the derivatives utilization by equity MFs to hedge their exposure for investors, fund managers, and regulators. Another key implication is for the market regulator to address the challenges and make necessary changes to the rules to increase participation by Indian equity MFs in the derivatives market.

Limitations of the Study and Scope for Future Research

The main limitation of this research is that we restricted the sample to 10 funds with significant holdings. A more elaborate study would provide better insights. A comparative study of derivative holdings over the last two decades will also reveal if, in previous years, derivatives were more popular amongst fund managers.

Authors' Contribution

Jaishankar Krishnamurthy developed the theoretical formalism, extracted the data, and performed the analysis. Jaishankar Krishnamurthy and Dr. Satyendra Pratap Singh contributed to the final version of the manuscript.

Conflict of Interest

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

Funding Acknowledgment

The authors received no financial support for the research, authorship, and/or for the publication of this article.

Note

An earlier version of the paper was submitted to pre-prints on an open-access website that is not a peer-reviewed journal/publication.

References

Almazan, A., Brown, K. C., Carlson, M., & Chapman, D. A. (2004). Why constrain your mutual fund manager? *Journal of Financial Economics, 73*(2), 289–321. https://doi.org/10.1016/j.jfineco.2003.05.007

Bansal, A., Gopalakrishnan, B., Jacob, J., & Srivastava, P. (2020). *When the market went viral: COVID-19, stock returns, and firm characteristics*. Available at SSRN. https://doi.org/10.2139/ssrn.3626273

Cao, C., Ghysels, E., & Hatheway, F. (2011). Derivatives do affect mutual fund returns: Evidence from the financial crisis of 1998. *The Journal of Futures Markets*, *31*(7), 629–658. https://doi.org/10.1002/fut.20489

Cici, G., & Palacios, L.-F. (2015). On the use of options by mutual funds: Do they know what they are doing? *Journal of Banking & Finance, 50*, 157–168. https://doi.org/10.1016/j.jbankfin.2014.09.008

Deli, D. N., & Varma, R. (2002). Contracting in the investment management industry: Evidence from mutual funds. *Journal of Financial Economics, 63*(1), 79–98. https://doi.org/10.1016/S0304-405X(01)00090-3

Devi, V. R., & Kumar, N. L. (2010). Performance evaluation of equity mutual funds. *The Journal of Indian Management & Strategy 8M, 15*(2), 22–35.

Dhanda, S. K., Batra, G. S., & Anjum, B. (2012). Performance evaluation of selected open ended mutual funds in India. *International Journal of Marketing, Financial Services & Management Research, 1*(1), 29–38.

Frino, A., Lepone, A., & Wong, B. (2009). Derivative use, fund flows and investment manager performance. *Journal of Banking & Finance, 33*(5), 925–933. https://doi.org/10.1016/j.jbankfin.2008.10.001

Glode, V. (2011). Why mutual funds "underperform." *Journal of Financial Economics, 99*(3), 546–559. https://doi.org/10.1016/j.jfineco.2010.10.008

Glossner, S., Matos, P., Ramelli, S., & Wagner, A. F. (2020). *Do institutional investors stabilize equity markets in crisis periods? Evidence from COVID-19*. Available at SSRN. https://doi.org/10.2139/ssrn.3655271

Goyal, M. M. (2015). Performance evaluation of top 10 mutual funds in India. *Indian Journal of Commerce & Management Studies, 6*(1), 46–50. https://www.ijcms.in/index.php/ijcms/article/view/241

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *The Journal of Finance*, *23*(2), 389–416. https://doi.org/10.2307/2325404

Johnson, L. D., & Yu, W. W. (2004). An analysis of the use of derivatives by the Canadian mutual fund industry. *Journal of International Money and Finance, 23*(6), 947–970. https://doi.org/10.1016/j.jimonfin.2004.05.006

Kaniel, R., & Wang, P. (2022). *Unmasking mutual fund derivative use*. Available at SSRN. https://doi.org/10.2139/ssrn.3692838

Koski, J. L., & Pontiff, J. (1999). How are derivatives used? Evidence from the mutual fund industry. *The Journal of Finance, 54*(2), 791–816. https://doi.org/10.1111/0022-1082.00126

Mandal, A. (2011). Hedging effectiveness of stock index futures contracts in the Indian derivative markets. *International Journal of Financial Management*, *1*(2), 1–20.

Marin, J. M., & Rangel, T. A. (2006). *The use of derivatives in the Spanish mutual fund industry*. Available at SSRN. https://doi.org/10.2139/ssrn.945191

Pal, S., & Chandani, A. (2014). A critical analysis of selected mutual funds in India. *Procedia Economics and Finance, 11*, 481–494. https://doi.org/10.1016/S2212-5671(14)00214-7

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies, 9*(3), 622–655. https://doi.org/10.1093/rcfs/cfaa012

Rehmani, A. (2018). Performance evaluation of select mutual funds: A public-private comparison. *Indian Journal of Finance, 12*(9), 41–55. https://doi.org/10.17010/ijf/2018/v12i9/131563

Sapar, N. R., & Madava, R. (2003). *Performance evaluation of Indian mutual funds.* Available at SSRN. https://doi.org/10.2139/ssrn.433100

Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business, 39*(1, Part 2), 119–138. https://www.jstor.org/stable/2351741

Treynor, J. L. (1965). How to rate management of investment funds. *Harvard Business Review*, *43*, 63–75.

Zaheeruddin, M., Sivakumar, P., & Reddy, K. S. (2013). Performance evaluation of mutual funds in India with special reference to selected financial intermediaries. *IOSR Journal of Business and Management*, *7*(2), 34–40.

About the Authors

Jaishankar Krishnamurthy holds a Chartered Accountant Degree from the Institute of Chartered Accountants of India and an MBA from the Richard Ivey School of Business, University of Western Ontario. He has over 25 years of experience in corporate working with Banks, MNCs, and the Big Four. His last assignment was working as a Senior Analyst for Oil & Gas for Ernst & Young Singapore. He is currently pursuing his Ph.D. from Alliance School of Business, Alliance University in the field of Management. He has co-authored three papers on mutuals, portfolio management services, and alternative investment funds in India.

Dr. Satyendra Pratap Singh is a Professor of Finance & Area Chair at the Alliance School of Business. He has an MMS degree (Gold Medalist) from MNNIT, Allahabad (Allahabad University), with a specialization in Finance and Marketing that he obtained in the year 2000. He completed his Ph.D. at Jiwaji University, Gwalior, in June 2010. Having a passion for academics, he has been part of reputed management institutes and universities. His areas of academic interest include Security Analysis & Portfolio Management, Corporate Finance, Financial Markets & Services, Financial Derivatives, Stock Market Operations, Personal Financial Planning, etc.