Impact of COVID-19 Pandemic on Mutual Fund Flows : Evidence from the Indian Mutual Fund Industry

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Abstract

Purpose : The objective of the study was to analyze the changing patterns in terms of systematic investment plans (SIP) investments, net inflow/outflow, and asset under management (AUM) of the Indian mutual fund industry. The study aimed to determine whether there had been noticeable changes in investment patterns AUM before COVID and during/post-COVID period across different investors and investment categories.

Methodology : While following descriptive research, data related to SIPs, net inflows as per scheme structure, aggregate AUM as per investment objectives, and investments in schemes (AUM) by different categories of investors were bifurcated into two segments. The first segment was concerned with pre-COVID duration, spanning October–December 2017 to October–December 2019. The second segment covered during/post-COVID, January–March 2020 to January–March 2022. A *t*-test was applied to examine the mean differences.

Findings : Only HNI investors increased their investment in all schemes during the COVID-19 pandemic. Retail investors boosted their shareholding in all schemes except debt-oriented ones. Except for HNIs and retail investors, the average AUM of banks and FIIs declined in equity-oriented schemes. However, corporate investors boosted their investments in all categories except gilt and equity-oriented schemes.

Practical Implication : Reasons for contradicting investment patterns exhibited by retail investors, HNIs, banks, and FIIs during the pre-COVID and COVID periods could be further explored by the managers to know the underlying reasons and act accordingly in such scenarios. Furthermore, mutual fund flows during the pandemic also indicated market sentiments. The investors and managers could use such changes in flows to make informed decisions.

Keywords : **mutual fund, COVID-19, AUM, SIPs, corporate, retail, HNIs, FIIs**

JEL Classification Codes : G11, G23

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The epidemic has resulted in financial catastrophe in many countries. The lack of economic activity resulted in financial difficulty for businesses and the government alike. Lockdowns had a double-edged effect on businesses since they lowered their income due to a lack of activity, which in turn caused a decline in stock prices (Shankar & Dubey, 2021). Lockdown and social isolation proved to be unsettling, given the massive population and problematic economic conditions, particularly in the finance sector (RamlaBeevi et al., 2021). The COVID-19 pandemic, just like other crises, whether it is rooted in finance or otherwise, had widespread financial and socio-economic impacts across the world. Due to unusually high levels of volatility and

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unpredictability, the stock markets have lost about 30% of the world's wealth in just 100 days (Bhattacharya, 2021). When it emanated in the Indian Territory, the stock market lost 20% to 40% of its value every day (Nagarajan & Chopra, 2023). As more incidents were confirmed, stock market returns decreased. Additionally, according to data, the initial days followed verified cases and then a significant decline in market activity post 40–60 days (Ashraf, 2020). When news breaks, the stock price can go up or down quickly, and trading volume can spike several times (Dey & Singh, 2022).

The volatility of the Indian stock market, which is inversely correlated to investor confidence, decreased during the COVID-19 era (Shankar & Dubey, 2021). However, the pandemic had a positive effect on trading volume. The COVID-19 pandemic and lockdown affected the global capital markets and mutual fund business, particularly the mutual fund sector in India (Maheen, 2021). Most mutual fund investors lost money during COVID-19. Lockdowns during the pandemic's early stages discouraged retail investment in mutual funds and stocks (Mishra et al., 2020). Mutual fund assets fell 6.9% (from 25.28 trillion to 23.53 trillion) in April 2019–2020. The fall might have been caused by the pre-COVID slowdown and the COVID outbreak (Rao et al., 2020).

In the post-pandemic environment, increased digital penetration and improved data speeds also enabled the transfer of asset shares into smaller cities and villages. The higher retail contribution made by SIPs demonstrates India's degree of digital penetration. As of February 28, 2022, there were 12.61 crore folios (126.1 million units) (Mordor Intelligence, 2022). Throughout the pandemic, the mutual fund industry expanded and intriguingly, in 2021, several smaller businesses acquired traction and surpassed the expansion of well-established major players. Small players made significant advancements throughout the year in tandem with the expansion of the equities market (Hasnaoui et al., 2021). However, SIP collections decreased by 4%, to ₹ 96,000 crore in the 2020–2021 fiscal year as a result of lockdowns brought on by COVID-19 (PTI, 2021). Many investors choose to halt their SIPs due to the coronavirus outbreak and the heightened uncertainty surrounding income. After peaking at ₹ 8,641 crores, the contribution fell for 11 consecutive months before rising to new heights (Research and Markets, 2022).

History has witnessed the Mutual Fund (MF) business, if ever damaged, had always rebounded stronger (Nagarajan & Chopra, 2023). The Indian Finance Ministry established sector-specific financial strategies and economic remedies to mitigate the pandemic. The markets welcomed the announcement and have strived hard to rise since (Behram, 2022; Bhattacharya, 2021). Low interest rates and lockdowns prompted investors toward mutual funds. Investors realized the importance of persistent saving due to job instability, as evidenced by inflows into systematic investment programs (Behram, 2022)

Indian Mutual Fund Industry : Recent Observations Through Literature Conducted Around the Covid-19 Pandemic

The studies conducted during the pandemic period revealed the market sentiment of the industry. Over 12 months (April 2019 to April 2020), the MF assets decreased by 6.9% (from 25.28 trillion to 23.53 trillion). The slowdown in the economy during the pre-COVID period and thereafter, the impact of the epidemic on the economy could have contributed to the fall (Rao et al., 2020). The recent past performance of a fund is one of the factors that retail investors consider which serves as an indicator of the relative sophistication of the Indian MF industry. The results observed by Singh and Dipika (2021) indicated that retail investors favored investing in funds with lower risk. Dey and Brown (2021) observed that during the COVID epidemic, the Indian stock market increased from high fear and high volatility to stability and decreased volatility later on, similar to what it was prior to COVID, and then quickly surged to above 50,000. Shanmugam and Ali (2021) examined how the viral epidemic impacted the Indian MF business between December 2019 and May 2020. This study was conducted in order to examine the performance of 25 equity-oriented direct growth funds. The findings confirmed that while a few schemes up

surged over time, the bulk of the funds declined in value. Veeravel et al. (2021) examined the impact of daily total confirmed cases and death cases on the stock market returns. According to the findings of his study, number of confirmed cases positively affected the stock market returns, while the number of confirmed deaths had a negative effect on the market returns. Naveen and Mallikarjunappa (2021) incorporated a dummy variable in their study to investigate pre-COVID and post-COVID impact on selected mutual fund schemes. In the case of large, mid, and multi-cap funds, the results demonstrated an average level of performance; however, the performance of small-cap funds beat the benchmark. Another study by Maheen (2021), during the pandemic, analyzed the performance of 1,271 actively managed Indian mutual funds for five months, from March 2020 to July 2020. The findings suggested that throughout the sample period, the widely held theory of greater alpha during the crisis was not true. However, proactive control measures undertaken by the government exhibited a favorable impact on the stock market despite the number of increasing cases (Dey & Sharma, 2022).

Shobha (2023) conducted an in-depth investigation of the current market circumstances following the COVID-19 epidemic, with an emphasis on the mutual fund industry from December 2019 to June 2021. According to her observations, the mutual fund industry was severely damaged by the COVID-19 outbreak, which resulted in a 24.26% decrease in asset holdings. When trading resumed, open-ended funds observed a 28.08% increase, while the initial lockout caused a decline in all MF investments. Interval funds, on the other hand, had a noteworthy 50% increase despite the overall 48.46% reduction in mobilized funds.

A few literatures highlighted the trends and changes in asset under management (AUM) and net inflows in mutual funds, and some of them captured the performance of schemes. The literature surrounding the COVID-19 pandemic in India overlooked a few key points. Recent literature barely covered the changing trends and patterns among different categories of investors and across different investment options. Instead of observing the trends and patterns on a month-to-month basis, this study has considered the average rise and fall during the pre-and post-COVID scenarios to gather more meaningful and sustained insight from the mutual fund industry.

The present study attempts to capture the impact of the pandemic while comparing the mutual fund flows before and during/post-COVID-19 pandemic scenarios. Despite the existence of previous studies on this topic, this one stands out for its unique coverage and approach. The study aims to investigate the reactions of various investor types before and during/after the pandemic, as well as the changes in average AUM during this period, revealing their sentiments toward various schemes. The study's usefulness lies in highlighting the conflicting investment patterns exhibited by retail, HNIs, banks, and FIIs during the pre-, during, and post-COVID period. The managers can explore the underlying reasons for these patterns. Furthermore, MF flows around the pandemic also signal market sentiments. Investors and managers could use these changes in flows to make informed decisions.

Thus, to cap the gap, the present study concentrates on deliberating emerging tendencies in the Indian mutual fund industry particularly around the pandemic. Therefore, the study intends to answer the following research questions to identify and interpret existing trends and patterns in the Indian MF industry while observing before and during/after the COVID-19 pandemic duration.

Research Questions and Objectives

- ***RQ1 :*** Has there been any noticeable change in SIP investment before and during/post-COVID-19 pandemic?

- ***RQ2 :*** Has there been any noticeable change in the inflow of schemes (open-ended, close-ended and interval schemes) during pre and post-pandemic?

- ***RQ3 :*** Are there statistically significant changes in the aggregate average AUM of the schemes designed as per investment objectives during pre and post pandemic?

↳ ***RQ4 :*** Are there statistically significant changes in the AUM of schemes invested by different categories of investors during pre and post-pandemic?

The above questions decide the scope of the study as well. In this study, "during" and "post" pandemic words have been used interchangeably.

The objective of the study is to analyze the changing patterns in terms of SIP investments, net inflow/outflow, and AUM of the Indian mutual fund industry. The study attempts to perceive whether there have been noticeable changes in investment patterns (AUM) before COVID and during/post-COVID period. The following categories have been considered to exhibit changing patterns of AUM before and during /after the post-COVID-19 breakout.

Methodology

In order to answer the above four research questions (from a to d), the paper has been divided into four segments (I–IV). Each segment deals with individual research questions separately.

↳ Aggregate SIP Investments.

↳ Inflows according to the open-ended close and interval scheme structure.

↳ Aggregate AUM as per investment objectives — Liquid/Money Market, Gilt, Debt Oriented, Equity Oriented, Balanced, ETFs (other than Gold), Fund of Funds investing Overseas.

↳ Scheme investments (AUM) are made by various investor types, including corporates, retail, HNIs, FIIs, and banks/FIs at the category level.

Data associated with SIPs, net inflows as per scheme structure, aggregate AUM as per investment objectives, and investments in schemes (AUM) by different categories of investors have been bifurcated into two segments. The first segment is concerned with pre-COVID duration: October–December 2017 to October–December 2019. The second segment is during/post-COVID January–March 2020 to January–March 2022. SIP contribution and net inflows in the pre-COVID and during/post-COVID phase have been examined on the basis of mean difference (*t*-test) and volatility (coefficient of variation). A *t*-test has been used to aggregate AUM according to investment objectives and Investments in schemes (AUM) by various investor types in order to investigate any significant mean differences. Volatility (coefficient of variation) in AUM during both periods has also been discussed.

Observations

Aggregate Inflow in SIPs Before and During/Post COVID-19 Pandemic

Has there been any significant changes in the AUM of SIP before COVID and during/post-COVID? Table 1 represents the SIP contribution from October 2017 to March 2022. The average contribution in SIP was higher during/in the post-pandemic period compared to the pre-pandemic duration. However, as indicated by the coefficient of variation (CV), investment in SIPs remained stable in pre-COVID duration compared to during/after COVID-19 duration. The mean difference (p-value = 0.029) between pre-COVID and during COVID indicated a significant difference in the average SIP contribution in the pre-COVID and during COVID phases. The slope value revealed an insignificant difference between pre-COVID and during COVID-19 (p-value = 0.181).

Table 1. ***SIP Contribution During Pre-COVID-19 (From October – December 2017 to October – December 2019 in Crore ₹)***

Mean	23390.33
SD	2448.425
CV	0.104677
SIP Contribution During COVID-19 (from January – March 2020 to January – March 2022)	
Mean	29173.78
SD	6384.648
CV	0.218849
Mean Diff. (*p*-value)	0.029
***P*-value Diff. in slope (*p*-value)**	0.181104

Source : Authors' calculation from data compiled from amfiindia.com/research-information/aum

Scheme Structure – Net Inflow in Open-Ended, Close-Ended, and Interval Schemes

Has there been any noticeable change in the inflow of schemes (open-ended, close-ended, and interval schemes) during pre and post-pandemic?

The average contribution in the open-ended scheme throughout the COVID period was larger than the pre-COVID period in the case of open-ended schemes (Table 2). As indicated by the coefficient of variation, the variations in the inflows in pre-COVID and during COVID were almost similar. The mean difference (p-value = 0.666) between pre-COVID and during COVID did not indicate significant variation in the average inflow of open-ended schemes in pre-COVID and during covid phase. Statistically, no significant difference was observed in the slope differences of pre-COVID and during COVID-19 inflows in open-ended schemes (p-value = 0.566). In closed-ended schemes, average AUM was higher in the pre-COVID period, though average inflow in pre-COVID was observed to be positive, whereas it was negative during the COVID period phase. The CV was observed to be high in the pre-COVID period as compared to during/post-COVID period, indicating that inflow was more volatile in the pre-COVID phase. The mean difference between pre-COVID and during-COVID scenarios was observed to be borderline insignificant (p-value = 0.06) in the case of close-ended schemes. The

Table 2. ***Inflows During Pre-COVID-19 (From October–December 2017 to October–December 2019 in Crore ₹)***

	Open-Ended	Close-Ended	Interval Funds
Mean	39,534.76	854.56	–270.91
SD	61,935.02	13,739.94	1,329.97
CV	1.56	16.07	–4.90
Inflows During COVID-19 (from Jan–Mar 2020 to Jan–Mar 2022)			
Mean	55,753.44	–14,839.68	–113.15
SD	83807.64	17251.83	378.8364174
CV	1.50	–1.16	–3.34
Mean Diff. (*p*-value)	0.666	0.06	0.751
***p*-value Diff. in slope (*p*-value)**	0.566	0.389	0.285

Source : Authors' calculation from data compiled from https://www.amfiindia.com/research-information/aum-data/age-wise-folio-data

p-value (0.389) against the difference in slopes of inflows in pre- and during COVID periods did not indicate much difference. In the case of interval funds, the coefficient of variation in inflows during pre- and COVID-19 exhibited small change, and there was no significant difference in slope (*p*-value = 0.285). In interval funds, the mean difference between both periods was not significant (*p*-value = 0.751).

Asset Under Management (AUM) as per Investment Objectives – Liquid/Money Market, Gilt, Debt Oriented, Equity Oriented, Balanced, ETFs (Other than Gold), and Fund of Funds Investing Overseas at Aggregate Level

Are there statistically significant differences between the pre-and post-pandemic aggregate average AUM of the schemes created in accordance with investment objectives?

Table 3 displays the descriptive statistics and changes in aggregate average AUM of different categories of schemes from October–December 2017 to January–March 2022.

Table 3. ***Descriptive Statistics of AUM Liquid/Money Market, Gilt, Debt Oriented, Equity Oriented, Balanced, ETFs (Other than Gold), and Fund of Funds Investing Overseas at Aggregate Level (%) Pre COVID-19 (From October–December 2017 to October–December 2019) and During/Post COVID-19 (From January–March 2020 to January–March 2022)***

Schemes		Corporates	Banks/FIs	FIIs	HNI	Retail
Liquid/Money market (in %)	Mean	79.64	5.23	0.0125	12.825	2.29
Pre COVID-19 (from Oct–Dec 2017	*SD*	4.5	1.44	0.004	3.72	0.478
to Oct–Dec 2019)	CV	0.06	0.28	0.32	0.29	0.21
Liquid/Money market (in %)	Mean	78.94 (0.51)	3.75 (0.02*)	0.01 (1)	15.40 (0.4)	1.88 (0.02*)
During COVID-19 (from Jan–Mar 2020	*SD*	2.13	0.77	0.0078	1.85	0.21
to Jan–Mar 2022)	CV	0.03	0.21	0.78	0.12	0.11
t-statistic and *p*-value of Diff. in Mean	*t*-value (*p*-value)	–0.66 (0.51)	2.62 (0.02*)	–1.44 (1)	–0.858 (0.4)	2.701 (0.02*)
p-value Diff. in slope	*p*-value	9.2	0.18	0.13	1.24	2.04
Gilt (in %) (from Oct–Dec 2017	Mean	61	0.93	1.90	27.2	9.19
to Oct–Dec 2019)	*SD*	3	0.28	0.67	4.19	1.05
	CV	0.05	0.30	0.35	0.15	0.11
Gilt (in %) During COVID-19	Mean	53.19	1.19	0.47	37.45	7.67
(from Jan–Mar 2020 to Jan–Mar 2022)	*SD*	1.26	0.29	0.43	1.14	0.49
	CV	0.02	0.24	0.91	0.03	0.064
t-statistic and *p*-value of Diff. in Mean	*t*-value (*p*-value)	5.71 (0.00**)	–1.74 (0.1)	4.91 (0.00**)	–5.71 (0.00**)	1.19 (0.01*)
p-value Diff. in slope	*p*-value	0.0009**	0.46	0.37	0.04*	0.012*
Debt Oriented (in %) (from	Mean	55.13	1.71	0.62	34.1	8.27
Oct–Dec 2017 to Oct–Dec 2019)	*SD*	2.50	0.423	0.29	3.6	2.34
	CV	0.05	0.25	0.47	0.11	0.28
Debt Oriented (in %) During COVID-19	Mean	57.87	2.64	0.125	35.75	3.60
(from Jan–Mar 2020 to Jan–Mar 2022)	*SD*	1.13	1.22	0.014	1.70	0.13
	CV	0.02	0.46	0.11	0.05	0.04
t-statistic and *p*-value of Diff. in Mean	*t*-value	–3.48	–2.42	4.92	–0.27	4.675

	(*p*-value)	(0.003**)	(0.027*)	(0.000**)	(0.785)	(0.000**)
p-value Diff. in slope	*p*-value	0.23	0.03*	0.90	0.43	0.007**
Equity Oriented (in %) (from	Mean	12.69	0.14	0.53	34.69	51.99
Oct–Dec 2017 to Oct–Dec 2019)	*SD*	2.12	0.02	0.109	1.47	1.57
	CV	0.17	0.14	0.21	0.04	0.03
Equity Oriented (in %) During COVID-19	Mean	9.28	0.09	0.31	36.27	54.03
(from Jan–Mar 2020 to Jan–Mar 2022)	*SD*	0.45	0.04	0.06	0.60	0.96
	CV	0.05	0.44	0.19	0.016	0.017
t-statistic and *p*-value of Diff. in Mean	*t*-value (*p*-value)	3.826 (0.001**)	2.268 (0.037*)	4.324 (0.001**)	–2.263 (0.038*)	–2.819 (0.012*)
p-value Diff. in slope	*p*-value	2.45	2.14	0.014*	1.65	0.04*
Balanced (in %) (from Oct–Dec 2017	Mean	11.59	0.095	0.39	55.46	32.455
to Oct–Dec 2019)	*SD*	2.61	0.028	0.16	3.70	5.86
	CV	0.23	0.29	0.41	0.07	0.18
Balanced (in %) During COVID-19	Mean	15.48	0.056	0.20	63.12	21.1
(from Jan–Mar 2020 to Jan–Mar 2022)	*SD*	1.14	0.009	0.1	1.18	0.99
	CV	0.07	0.16	0.50	0.02	0.05
t-statistic and *p*-value of Diff. in Mean	*t*-value (*p*-value)	–3.45) (0.003**)	–0.776 (0.010*)	2.925 (0.00**)	–5.94 (0.00**)	–4.726 (0.00**)
p-value Diff. in slope	*p*-value	0.046*	0.015*	0.043*	0.081	0.012*
EFTs (other than gold) (in %)	Mean	89.33	2.54	1.56	2.82	3.73
(from Oct–Dec 2017 to Oct–Dec 2019)	*SD*	2.43	1.30	1.015	0.55	1.36
	CV	0.03	0.51	0.65	0.20	0.36
EFTs (other than gold) (in %)	Mean	91.3	1.87	0.03	4.94	1.77
During COVID-19	*SD*	1.7	1.49	0.014	0.26	0.58
(from Jan–Mar 2020 to Jan–Mar 2022)	CV	0.02	0.80	0.47	0.05	0.33
t-statistic and *p*-value of Diff. in Mean	*t*-value (*p*-value)	–1.489 (0.156)	0.282 (0.782)	5.088 (0.00**)	–11.24 (0.00**)	–3.2 (0.006**)
p-value Diff. in slope	*p*-value	0.614	0.273	0.035*	0.038*	0.045*
Funds of Funds Investing	Mean	21.3	0.0015	0	46.99	31.67
Overseas (in %) (from Oct–Dec 2017	*SD*	1.24	0.005	0	5.19	4.6
to Oct–Dec 2019)	CV	0.06	3.33	0	0.11	0.15
Funds of Funds Investing Overseas (in %)	Mean	15.99	0.01	0.002	60.90	23.08
(from Jan–March 2020	*SD*	0.88	0.008	0.004	0.92	0.74
to Jan–March 2022)	CV	0.05	0.80	2.00	0.02	0.03
t-statistic and *p*-value of Diff. in	*t*-value	9.868	–2.135	–1.512	–6.33	4.241
Mean	(*p*-value)	(0.00**)	(0.05*)	(0.15)	(0.00**)	(0.001**)
p-value Diff. in slope	*p*-value	0.068	0.017*	0.40	0.009**	0.0008**

Source : Authors' calculation from data compiled from https://www.amfiindia.com/research-information/aum-data/age-wise-folio-data

Note. **Significant at 1% level of significance, *Significant at 5% level of significance.

In the case of *money liquid /market schemes*, AUMs of corporates, Banks/FIs, HNIs, and retail categories were observed to be more consistent during the period, whereas only FIIs exhibited more stability before the cc as compared to during/post COVID-19 period. Average AUM (%) in Banks/FIs and retail investors during the COVID period was low as compared to before. Average AUM in the case of HNIs was high during the COVID period as compared to before. The slopes concerned with the pace of either fall or rise in pre- and during COVID periods were not noteworthy. Table 3 shows that, in the context of liquidity/money market schemes, there was little variation in the average AUMs of corporate categories, FIIs, and HNIs during the aforementioned periods. The mean differences (corporate; p-value = 0.51, FIIs; p-value = 1.0, HNIs; p-value = 0.40) were not significant except in the case of banks/FIs and retail investors (banks/FIs; p-value = 0.02 retail; p-value = 0.02). In both times, i.e., before and during/post COVID-19, p-values against the slope showed that, statistically, there was little variation in all periods across all categories.

The average aggregate AUM of *gilt schemes* (Table 3) was observed to be low in the case of corporates, FIIs, and retail investors during the COVID period when compared with the pre-COVID scenario, whereas in the case of banks/FIs, it was observed to be high. In the case of Gilt funds, Table 3 exhibits that except bank/FIs category (p-value = 0.10), all categories exhibited significant differences in average AUM before COVID and during the COVID period. Corporates, HNIs, and Retail categories exhibited significant changes (p-values = 0.0009, 0.04, 0.012) in the slope during the mentioned periods. However, banks/FIs and FIIs did not indicate noteworthy changes in slope (p-values = 0.46, 0.37) during both periods. Corporates, FIIs, HNIs, and retail investors had significant changes in their mean value (p-values=0.00, 0.00, 0.00, 0.01). Average AUM incorporates banks/FIs, HNIs, and retail categories that exhibited low volatility during/post-pandemic phase as compared to the COVID phase. In the case of FIIs, AUM was observed to be more volatile during the COVID period as compared to before.

In the context of *debt-oriented schemes*, there was an increase in average AUM in the case of corporates, banks/FIs, and HNIs during the COVID phase when compared with before the COVID period, whereas low average AUM was reported in the case of FIIs and retail category investors. However, AUM was steadier in case of corporates, FIIs, HNIs, and retail category investors, except in case of banks/FIs, as indicated by their coefficient of variations during the COVID-19 period. In the case of debt-oriented schemes, a significant change was observed in the average AUM during both periods in the case of corporate investors (p-value = 0.003). However, the slope difference had no significant change (p-value = 0.23). Banks/FIs investment pattern decreased in starting of COVID-19, but it recovered gradually after only one quarter, which has been exhibited by a significant difference in the mean values (p-value = 0.027). The same has been supported by significant changes in slope values as well (p-value = 0.03) for the concerned periods. FIIs and retail both exhibited significant mean (p-values = 0.00, 0.00) differences. The slope difference was significant for retail investors (p-value = 0.007) during the period.

In the context of average AUM of *equity-oriented schemes* at the aggregate level, an increase in average AUM was observed in case of HNIs and retail investors during the COVID-19 period, while the same was decreased in case of corporates, banks/FIs, and FIIs as compared to pre- COVID phase. The increase/decrease in average AUM was significant across all categories of investors as indicated by significant differences in average AUM p-values (corporates; 0.001, banks/FIs; 0.037, FFIs; 0.001, HNIs; 0.038, retail; 0.012). The slope was found to be significant only in the case of FIIs and retail category (p-values = 0.014, 0.04). In the equity-oriented scheme, AUM seemed to be more consistent during the COVID-19 period in case of corporates, FIIs, HNIs, and retail investors, whereas it was more volatile during the COVID-19 phase in the case of banks/FIs. Other categories were deemed inconsequential, with the exception of retail and FIIs.

Balanced schemes, as indicated by average values of overall AUM, were observed to be high in the corporates and HNIs category during the phase as compared to the pre-COVID phase, whereas in banks/FIs, FIIs and retail category, average AUM was low. The movement of AUM was observed to be steadier in corporate, banks/FIs,

HNIs, and retail categories during the COVID phase as compared to the pre-COVID phase, except for FIIs. The average differences between pre-COVID and during COVID phase were observed to be significant across all category of investors as indicated by *p*-values (corporates; 0.003, banks/FIs; 0.010, FIIs; 0.000, HNIs; 0.000, retail; 0.000). AUM of corporates, banks/FIs, HNI, and retail investors found to be steadier during covid phase except for FIIs. With the exception of HNIs (*p*-value = 0.081), the slope differences for corporates, banks/FIs, FIIs, and retail were significantly different before and throughout the COVID era.

In the case of *ETFs (other than gold),* average AUM increased in corporate and HNIs categories as compared to banks/FIs, FIIs, and retail investors from pre-COVID to during the COVID period (Table 3). The increase was statistically notable in the case of HNIs only (*p*-value = 0.000**). The decline in average AUM was significant in the case of FIIs and retail investors (*p*-values = 0.000**, 0.000**). Except in the case of banks/FIs, the flow of AUM was more consistent in the case of corporates, FIIs, HNIs, and retail categories during the COVID phase as compared to the pre-COVID phase, as indicated by their CVs. The slope differences were observed to be noteworthy in the case of FIIs, HNIs, and retail category investors.

In the context of *fund of funds* investing, overall average AUM declined significantly in the case of corporate and retail category investors (*p*-values = 0.000**, 0.001*) when compared to banks, FIs, FIIs, and HNIs during the COVID phase. However, the increase was statistically noteworthy in case banks/FIs and HNIs only (*p*-values = 0.05*, 0.000*). AUM was observed to be more regular in the case of banks/FIs, HNIs, and retail segments during/the post-pandemic period. In the case of FIIs, AUM was more volatile during the COVID phase, where it maintained its position in the case of corporates. The slopes were observed to be noteworthy in the case of banks/FIs, HNIs, and retail categories.

Analysis of Investments in Schemes (AUM) by Different Categories of Investors, Corporates, Banks/FIs, FIIs, HNIs, and Retail Category Investors

Are there statistically significant changes in the AUM of schemes invested by different categories of investors during the pre and post-pandemic?

This section deals with investment analysis by different categories of investors in MFs. Table 4 exhibits the descriptive statistics and changes in the average AUM of different categories of investors during the period, respectively. Table 4 indicates investments by *Corporate Category Investors* represented by average AUM. In the case of corporates, during the pre-COVID phase (from October–December 2017 to October–December 2019) average investment was highest in the case of debt-oriented schemes, followed by liquid/money market schemes and balanced schemes. Exposure was least for fund of funds schemes. However, during/post-COVID phase,

Table 4. ***Descriptive Statistics of AUM Corporates, Banks/FIs, FIIs, HNIs, and Retail Category Investors from Pre-COVID-19 (From October–December 2017 to October–December 2019) and During/Post COVID-19 (From January–March 2020 to January–March 2022)***

Category of the Scheme		Liquid/ Money Market	Gilt	Debt Oriented	Equity Oriented	Balanced	ETFs (Other than Gold)	Fund of Fund Investing Overseas
Corporates Pre COVID-19	Mean	335213.55	5958.29	392783.52	96152.55	29989.59	10329.72	399.17
(from Oct–Dec 2017	*SD*	53498.20	1440.79	42232.13	15063.52	18895.24	32498.64	64.40
to Oct–Dec 2019)	CV	0.16	0.24	0.11	0.16	0.63	3.15	0.16
Corporates During COVID-19	Mean	464254.62	9123.94	457458.24	94140.92	56940.40	257377.31	2130.67
(from Jan–Mar 2020	*SD*	50200.31	1413.53	55015.52	21675.37	13753.71	83720.49	1279.04
to Jan–Mar 2022)	CV	0.11	0.15	0.012	0.23	0.24	0.33	0.60

t-statistic and *p*-value	*t*-value	–4.975	–4.436	–2.63	0.216	–3.26	–4.853	3.82
of Diff. in Mean	(*p*-value)	(0**)	(0**)	(0.01*)	(0.832)	(0.005*)	(0**)	–(0.001**)
p-value Diff. in slope	*p*-value	0.91	0.020	0.068	7.99	2.54	4.84	4.47
Banks/FIs (from Oct–Dec 2017	Mean	23868.61	141.80	11041.067	1055.77	182.01	2502.66	0.05
to Oct–Dec 2019)	*SD*	8821.38	146.66	2082.37	108.073	41.23	1614.61	0.144
	CV	0.37	1.03	0.19	0.10	0.23	0.65	2.88
Banks/FIs During COVID-19	Mean	22012.65	204.47	21104.35	874.53	196.56	4104.26	2.03
(from Jan–Mar 2020	*SD*	4750.68	57.11	10201.84	147.80	33.32	1800.51	1.89
to Jan–Mar 2022)	CV	0.22	0.28	0.48	0.17	0.17	0.44	0.93
t-statistic and *p*-value of	*t*-value	0.524	–1.126	–2.734	2.8	–0.776	–1.873	–2.94
Diff. in Mean	(*p*-value)	(0.608)	(0.277)	(0.015*)	(0.013*)	(0.449)	(0.79)	(0.09)
p-value Diff. in slope	*p*-value	2.54	1.29	0.005**	0.035*	0.29	1.25	5.38
FIIs (from Oct–Dec 2017	Mean	49.67	198.696	3885.08	4130.33	1080.07	1903.53	0
to Oct–Dec 2019)	*SD*	21.39	67.91	1592	760.88	346.95	1181.29	0
	CV	0.43	0.34	0.41	0.18	0.32	0.62	0
FIIs During COVID-19	Mean	76.67	79.8	96905	3067.78	668.70	81.09	0.59
(from Jan–Mar 2020	*SD*	48.46	77.14	83.100	482.19	207.79	17.98	0.52
to Jan–Mar 2022)	CV	0.63	0.97	0.001	0.16	0.31	0.22	0.88
t-statistic and *p*-value of	*t*-value	–1.441	3.272	5.172	3.336	2.877	4.363	–3.16
Diff. in Mean	(*p*-value)	(0.169)	(0.005**)	(0**)	(0.004*)	(0.011*)	(0*)	(0.006*)
p-value Diff. in slope	*p*-value	0.176	0.33	8.22	0.0003**	0.043*	0.53	0.00006**
HNI (from Oct–Dec 2017	Mean	63626.56	2631.17	259026.91	275704.41	110012.73	3134.44	895.93
to Oct–Dec 2019)	*SD*	22550.45	378.22	12866.30	27849.78	61488.52	1543.95	297.78
	CV	0.35	0.14	0.05	0.10	0.56	0.49	0.33
HNI During COVID-19	Mean	89538.47	6294.47	283888.16	369467.22	230014.27	13926.37	8216.37
(from Jan–Mar 2020	*SD*	1106.47	1106.47	21824.90	100153.28	52193.49	4430.17	4698.26
to Jan–Mar 2022)	CV	0.01	0.18	0.08	0.27	0.23	0.32	0.57
t-statistic and *p*-value of	*t*-value	–3.182	–0.63	–0.823	–1.962	–3.557	–1.289	–0.96
Diff. in Mean	(*p*-value)	(0.06)	(0.000**)	(0.014*)	(0.001*)	(0.000*)	(0.000**)	(0.000**)
p-value Diff. in slope	*p*-value	0.04*	0.217	0.196	6.96	0.203	5.74	1.54
Retail (from Oct–Dec 2017	Mean	10181.02	867.45	59174.07	413133.9	67456.22	3603.31	558.89
to Oct–Dec 2019)	*SD*	1855.80	199.33	20398.51	25104.24	8965.292	1304.12	43.16
	CV	0.18	0.23	0.34	0.06	0.13	0.36	0.08
Retail During COVID-19	Mean	11043.44	1315.36	28409.15	554333.4	76865.37	5002.99	3077.02
(from Jan–Mar 2020	*SD*	1228.75	215.08	2600.83	146202.4	13897.34	2640.89	1784.72
to Jan–Mar 2022)	CV	0.11	0.16	0.09	0.26	0.18	0.53	0.58
t-statistic and *p*-value of	*t*-value	–1.096	–4.32	4.23	–2.692	–1.609	–1.344	–3.99
Diff. in Mean	(*p*-value)	(0.289)	(0.001**)	(0.001**)	(0.016*)	(0.127)	(0.198)	(0.001**)
p-value Diff. in slope	*p*-value	0.89	0.002**	0.0008***	1.23	0.0085**	0.029*	1.18

Source : Authors' calculation from data compiled from https://www.amfiindia.com/research-information/aum-data/age-wise-folio-data

Note. **Significant at 1% level of significance, *Significant at 5% level of significance.

exposure was highest in liquid/money market schemes, which was closely followed by debt-oriented schemes. Corporations increased their stake in all types of investments during the COVID phase except in the case of equity schemes. Corporates exhibited steady behavior during the COVID-19 phase as far as investments in the liquid/money market, gilt, debt, and balance were concerned. In the case of investments in equity and FoFs, investments were more stable in the pre-COVID phase.

Corporate investors' investment patterns exhibited statistically significant differences, as observed in average AUM in pre-COVID and during the COVID phase in the case of Liquid, Gilt, Debt, Balanced, and Fund of funds (p-values = 0.00, 0.00, 0.018, 0.005, 0.001) except Equity oriented schemes (p-value = 0.832). No significant difference was observed in slopes across all categories of investments by corporates.

Equity-oriented schemes during COVID-19 declined. Balance, ETFs (other than Gold), and Fund of Funds investing overseas fund schemes have found healthy growth in their investing pattern.

As indicated by Table 4, *Banks/FIs* increased their stake in gilt, debt, balanced, ETFs (other than gold), and fund-of-funds schemes during the COVID-19 phase when compared with the pre-COVID phase, whereas they lessened their investment in liquid and equity schemes. However, this increase/decrease was statistically significant (Table 4) in the case of debt-oriented (p-value = 0.015) and equity-oriented schemes (p-value = 0.013) only. Investments by banks/FIs were steadier in liquid/money market, gilt, and balanced ETFs (other than gold) and FoFs during the COVID phase. Investment in debt-oriented schemes and equity-oriented schemes was less volatile in the pre-COVID phase. Slops of investments in different categories of investments pre- and during the COVID phase were not noteworthy except in debt-oriented schemes and equity-oriented schemes.

Table 4 exhibits investment patterns by *FIIs*. FIIs increased their stakes in liquid, debt, and FoF schemes during the COVID-19 phase, but this increase was significant (Table 4) only in the case of debt-oriented schemes and FoFs (p-value = 0.00, 0.006). As indicated by the average AUM during the period, FIIs decreased their investments in gilt, equity, balanced, and ETFs (other than gold) schemes. Statistically, this decrease was significant in all cases: Gilt (p-value = 0.005), Debt-oriented (p-value = 0.0), Equity-oriented (p-value = 0.004), Balanced (p-value = 0.011) ETFs (other than gold) (p-value = 0.0). As far as constancy is concerned, FIIs were more consistent in the case of investments in debt and ETFs (other than gold) during the COVID-19 phase. Trivial change was there in the case of equity and balanced schemes. Consistency was more in the case of liquid/money market and gilt schemes in the pre-COVID phase. Slopes of investment were observed to be significant in the case of equity (p-value = 0.0003), balanced (p-value = 0.043), and FoFs schemes (p-value = 0.00006).

HNIs increased their stakes in all categories of schemes during the COVID-19 pandemic (Table 4). Nevertheless, the increase was notable across all schemes (p-values: 0.00, 0.014, 0.001, 0.00, 0.00, 0.00) except in liquid/money market schemes (p-value= 0.06). The slopes during both periods did not exhibit any significant difference except in the case of liquid/money market schemes (p-value = 0.04). Investments by HNIs in liquid/money market, balanced, and ETF (other than gold) were found to be more consistent during the COVID phase. In the case of gilt, debt, equity, and FoFs-based schemes, investment by HNI was steadier in the pre-COVID period as compared to during the COVID phase, as indicated by their AUM.

Retail investors increased their stake in all schemes except in debt schemes as indicated by the average values of schemes in pre-COVID and during the COVID period. The decrease in debt scheme was statistically significant (p-value = 0.0001). However, the increase was significant in the case of gilt, equity, and FoF schemes only (p-values = 0.001, 0.016, 0.001). The investment pattern, however, was more consistent in liquid/money market, gilt, and debt schemes during the COVID period as compared to the pre-COVID period. A contradictory trend was observed for equity, balanced, ETFs (other than gold), and FoF investments. A significant difference was observed in the slopes of gilt, debt, and balanced schemes.

Table 5 shows the direction of increase and decrease in investment patterns in different schemes through the arrow. The arrows exhibited in the table indicate the direction of change in investment (increase/decrease) during the COVID-19 phase.

Table 5. ***Increase/Decrease in Aggregate Average Total AUM (%) During COVID-19 Period (From January–March 2020 to January–March 2022) Compared to Pre-COVID-19 Period (From October–December 2017 to October–December 2019)***

Schemes (%)	Corporates	Banks/FIs	FIIs	HNI	Retail
Liquid Money Market	↓	↓*	↓	↑	↓
AUM Gilt	↓**	↑	↓**	↑**	↓**
Debt Oriented	↑**	↑*	↓**	↑	↓**
Equity Oriented	↓**	↓*	↓**	↑*	↑*
Balanced	↑**	↓**	↓**	↑**	↓**
ETF (Other than Gold)	↑	↓	↓**	↑**	↓**
Fund of Fund Investing Overseas	↓**	↑*	↑	↑**	↓**

Source : Authors, compiled from previous tables.

Note. **Significant at 1% level of significance, *Significant at 5% level of significance.

Table 6. ***Changes in Investment Patterns (AUM) by Different Category of Investors During/Post COVID-19 Phenomena (From January–March 2020 to January–March 2022) Compared to Pre-COVID (From October–December 2017 to October–December 2019)***

Category (Absolute)	Liquid Money Market	AUM Gilt	Debt Oriented	Equity Oriented	Balanced	ETF (Other Than Gold)	Fund of Fund Investing Overseas
Corporates	↑**	↓**	↑**	↓	↑**	↑**	↑**
Banks/FIs	↓	↑	↑*	↓*	↑	↑	↑
FIIs	↑	↓**	↑**	↓**	↓*	↓**	↑**
HNI	↑	↑**	↑*	↑**	↑**	↑**	↑**
Retail	↑	↑**	↓**	↑*	↑	↑	↑**

Source : Authors, compiled from previous tables.

Note. **Significant at 1% level of significance, *Significant at 5% level of significance.

Table 5 indicates an increase/decrease in total AUM (%) in pre-COVID and during COVID-19 phenomena in different schemes at the aggregate level. As indicated by Table 5, average AUM decreased during the COVID-19 period in the case of liquid schemes across all categories of investors except in the case of HNIs. In gilt schemes, average AUM increased in banks/FIs and HNI, whereas a fall in AUM was observed in the case of corporates, FIIs, and retail categories. In the debt category, the same pattern was observed as in the case of gilt schemes across all investors except for corporates. In equity-oriented schemes, there was a decrease in the average AUM of corporates, banks, and FIIs, whereas an increase was observed in the case of HNIs and the retail category. In the case of balanced schemes, average AUM increased in corporate and HNIs as against banks, FIIs, and retail categories.

In the case of a liquid money market scheme, all categories of investors decreased their stake except HNIs. The decrease in investment by banks/FIs was observed to be significant. Gilt funds encountered a noticeable decrease in investment by corporates, FIIs, and retail categories (p-values were less than 0.01). Debt-oriented schemes increased in corporate, banks, and HNI, and growth in corporate categories was more significant (p-values were less than 0.01). In the case of equity-oriented schemes HNI and retail category investment increased and was significant.

Table 6 exhibits investment patterns across different categories of investors on the basis of average AUM (Volume). Corporates, FIIs, HNIs, and retail increased their stake in liquid schemes except banks/FIs during the COVID-19 period as compared to the pre-COVID period. In the case of gilt schemes, HNIs, retail, and banks/FIs increased their stake, whereas corporates and FIIs decreased their stakes during the COVID period. In the case of debt-oriented schemes, all category investors exhibited an increase in investment except retail category investors. In the equity-oriented schemes, HNIs and retail categories indicated an increase in investment, whereas corporates, Banks/FIs, and FIIs decreased their stakes. In the balanced category, except FIIs, all category investors increased their stakes. ETF (other than gold) category also experienced the same pattern of investment as in the case of balanced schemes. It is noteworthy that during the COVID period, investors in all categories increased their investment in FoFs.

Findings

Aggregate Inflow in SIPs

Average contribution in SIP was higher during/post-pandemic as compared to pre-pandemic duration. The difference between average pre and post-pandemic SIP was observed to be statistically significant.

Aggregate Inflow in Open-Ended, Close-Ended, and Interval Funds

In the AUM of open-ended, close-ended, and interval funds, no significant change was noticed while comparing pre- and post-COVID duration.

Aggregate Asset Under Management (AUM) as per Investment Objectives – Liquid/Money Market, Gilt, Debt Oriented, Equity Oriented, Balanced, ETFs (Other than Gold) and Fund of Funds Investing Overseas

- In the case of liquid schemes, average AUM declined across all categories of investors except HNI category investors during the pandemic period.
- In the guilt scheme, growth in average AUM was observed in the case of banks/FIs and HNI. However, average AUM declined in the case of corporates, FIIs, and retail categories of investors.
- In the case of the debt category, average AUM increased in corporate, banks/FIs, and HNI, whereas a fall in AUM was observed in the case of FIIs and retail categories.
- In equity-oriented schemes, there was a reduction in the average AUM of corporates, banks, and FIIs, but growth was noticed in the case of HNIs and retail category investors.
- In the case of balanced schemes, average AUM increased in corporate and HNIs as compared to banks, FIIs, and retail categories.
- In the case of ETF (other than gold), an increase in the average AUM of corporate and HNI was observed. However, a decline can be seen in banks, FIIs, and retail category investors.
- In the case of FoF investing overseas, average AUM during the pandemic increased in the case of banks, FIIs, HNI, and corporate, whereas a decrease was observed in retail category investors.

Investments in Schemes (AUM) by Different Categories of Investors — Corporates, Banks/FIs, FIIs, HNIs, and Retail Category Investors

- While examining AUM according to investor category, it was observed that corporate category investors increased their investments across all investment categories except gilt and equity-oriented schemes.
- Banks/FIs category investors increased their stake in all schemes except liquid money market and equity-oriented schemes during the COVID-19 pandemic.
- In the case of the FIIs category, growth was observed in liquid money market, debt and FoF investing overseas, whereas there was a decrease in gilt, equity, and balance schemes.
- Only the HNI category of investors increased their stake in all types of schemes during the COVID-19 pandemic.
- Retail category investors also increased their stake in all types of schemes except debt-oriented schemes.

Conclusion

Observations differ from previous studies due to variations in study duration and methodology. In this case, also, observations in the pre- and during/post-COVID pandemic period may contradict the earlier studies. In the context of the average AUM of schemes; in the case of the liquid money market, only banks and retail investment categories show a significant difference during the study period. In the case of the average AUM of the gilt scheme, corporates, FIIs, HNI, and retail categories' investment patterns have significant mean differences. In debt-oriented schemes, corporate, banks/FIs, FIIs, and retail investors' investing patterns are affected by the pandemic. Equity-oriented schemes and balanced schemes show notable variations across all investor categories. There are notable distinctions between the retail, FII, HNI, and ETF (other than gold) schemes of investing patterns. All investor types, except FIIs, show notable shifts in their investment patterns under the fund of funds investing overseas plan.

According to the reflection through the investor category, the average AUM in the corporate category indicates that corporates have made significant changes in their investment in pre- and during/post-pandemic scenarios in the liquid money market, gilt, debt-oriented, balanced fund, EFTs (other than gold), FoF investing overseas schemes except equity-oriented schemes. However, banks/ FIs category investors make noticeable changes in investment in debt and equity-oriented schemes only, as indicated by significant mean differences. Interestingly, FIIs and HNIs significantly change their investment across all schemes, except in liquid/money market fund schemes. As indicated by differences in average AUM before COVID-19 and during/post-pandemic, retail investors significantly changed their investment in gilt, debt-oriented, equity-oriented, and FoF investing overseas. During the pandemic period, various investor categories did not exhibit uniform investment patterns. Investors from corporates, banks/FIs, FIIs, HNIs, and retail categories follow their investment patterns during the pandemic.

Practical Implications

In order to understand the fundamental causes and respond appropriately in covid pandemic-like situations, analyzing the patterns of mutual fund flows before and during/after pandemic-like situations will guide the fund managers and enable them to act accordingly in similar scenarios in the future.

Limitations of the Study and Scope for Further Research

The study is based on secondary data related flows, AUM flows, and investment by different categories of investors. It only covers quarterly changes in AUM flows according to investors' category and type of schemes during the mentioned period.

Authors' Contribution

Dr. Ajay Pratap Yadav created the concept and the quantitative designs for the study. Mr. Ratnesh Kumar Yadav retrieved relevant research articles. Mr. Ratnesh Kumar Yadav did a statistical analysis. The same was overseen by Dr. Ajay Pratap Yadav, who also confirmed the analytical techniques and interpretations. Mr. Ratnesh Kumar Yadav used SPSS to do the numerical calculations. Mr. Ratnesh Kumar Yadav wrote 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.

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