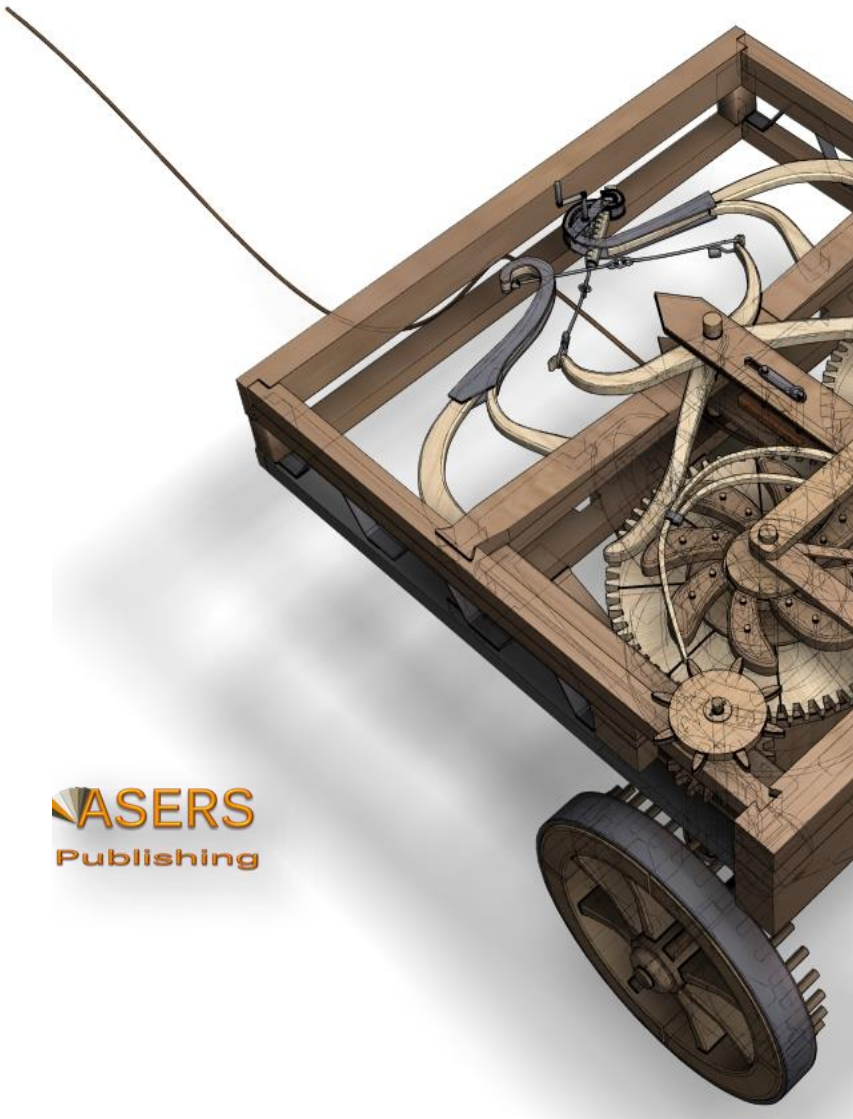
Theoretical and Practical Research in Economic Fields



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Autoregressive Distributed Lag Approach for Estimating the Nexus between Net Asset Value of Mutual Fund and Economic Determinants in India

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Abstract: India has seen a phenomenal growth in cumulative mutual fund investment from Rs 7.93 trillion in 2012 to Rs 40.38 trillion in 2022, which is more than a five-fold increase since last 10 years. Retail investors are now realizing the power of savings and Systematic Investment Plans (SIP) to build long term wealth. A financial literacy wave which is sweeping across India has projected mutual funds as a significant contributor and beneficiary of this phenomenon. The evolving economic landscape of India provides investors with excellent opportunities to capitalize on these fluctuations through systematic investment in safe investment vehicles like mutual funds. The market associated with mutual funds is always subjected to economic risks. The erratic fluctuations in macroeconomic variables can largely explain the Volatility in Net Asset Value (NAV) of equity oriented mutual fund schemes. With this background, this paper examines the impact of select macroeconomic variables on mutual funds' performance in India. To analyse this, monthly observations of select macroeconomic variables, average NAV of large cap, mid cap, and small cap funds collected for a period of 10 years starting from January 2013 to November 2022. Descriptive statistics is used to probe the characteristics of the variable. In addition, correlation and ordinary least square method is applied to check the existing relationship and impact level of macroeconomic factors on NAV of select schemes. Lastly, short and long run relationship is analysed using Autoregressive Distributed Lag Model (ARDL).

Keywords: net asset value; macroeconomic factors; mutual fund; large cap; small cap and mid cap.

JEL Classification: E40; E22; C52; G10; G50; R11.

Introduction

Mutual Fund is a professionally managed investment fund that pools money from different investors to invest in different asset classes. Mutual funds are rapidly gaining importance in emerging markets especially in India. As of September 30, 2022, Assets Under Management (AUM) of Indian Mutual Fund Industry stood at ₹ 38,42,351 crore and the Indian Mutual Fund Industry is expected to hit the 90 trillion marks by 2030. The gross domestic savings rate has increased to 29.3% in 2021 from 28.1% in 2019. Professionally managed mutual funds not only have the advantages of diversification, increased liquidity, and rolling over earnings but also provide significantly better returns than bond markets, Fixed Deposits, and pension savings (Li *et al.* 2021).

In the last decade, Indian capital market had witnessed tremendous growth not only in number of folios but also the cumulative Mutual Fund investment, especially in the equity sector. Folio accretion has been spotted in

equity funds partly due to growing investment in Equity Linked Savings Scheme and partly due to the general economic upturn in the country (Ansari 2021). With the Government pushing savings and investment incentives onto the retail investors in the form of tax benefits, the sector is looking at a bright future with a CAGR of 21.7% in the next 4 years. Komleh (2018) agrees that investment companies and mutual funds are vital financial institutions in the capital markets that by providing numerous benefits to investors, sending resources into the capital market, has an important role on stability, balance, and development in capital markets. Thus, it is imperative to study factors that affect the Net Asset Value of equity fund schemes to help investors decide the mutual funds that best suit their risk appetite and investment objectives.

1. Behaviour of Economic Factors on Mutual Fund Performance

In spite of being a relatively safer investment compared to its counterparts, Mutual Funds exist in a volatile market attributed to volatility of their underlying assets, stocks. Diversification has on one hand mitigated unsystematic risk, but mutual funds are still subject to economic forces namely fluctuations arising in stock prices due to the ever-changing macro environment. Macroeconomic variables such as inflation, GDP, consumer price index impact the level of consumer spending and hence affects AUM as well as the performance of mutual funds as measured by the changing Net Asset Value. Thus, investors especially the retail investors should be aware of the impact of macroeconomic variables on the NAV to make informed investment decisions.

Studies which are related to the influence behavior of micro and macro-economic factors on the returns of mutual funds have been identified very less. In this regard, Pradhum and Joshi (2019) undertook a study to determine the impact of economic events on risk adjusted returns of Indian mutual funds and found that there is significant long run and short run impact of macroeconomic variables on the mutual fund performance. This study is built on the existing literature of Avramov and Wermers (2006) and Moskowitz (2000), where it is assumed that mutual fund returns may have a time-varying component. These returns can be expressed as a linear function of a set of macroeconomic variables (Ferson and Schadt1996).

With this backdrop, this study examines the select macroeconomic factors which determines the NAV performance of large cap, mid cap and small cap equity mutual funds in India. Also, to what extent these factors influence on NAV performance in short run as well as long run. As part of evolving the context for the present study, the next section presents about the base theories for testing as well as existing studies related to this context. Third and fourth sections deal with this econometric model and analysis to meet the objective. Finally, the last section discusses the conclusion and implications.

1.1 Problem Statement

In the absence of a well-developed, transparent, and responsive financial market, businesses would suffer and the spillover effects will also be borne by the people living in the economy. Despite the financial literacy wave increasing AUM, the consistent poor performance of mutual funds questions the play of external factors in determining the NAV of various funds. Stock prices reflect the market sentiments as well as the impact of economic cycles on the revenue generating capacity of the business. Stocks being the underlying assets for equity mutual funds necessitates the study of the impact of the economy on mutual funds. Macroeconomic variables are accurate indicators of the economy and therefore must be factored in the study of mutual funds.

Retail investors tend to invest in mutual funds more than any other asset class due to the safety blanket that they carry in the context of diversification and professional management of funds. Despite this, the majority of investors only invest in equity fund which exposes them to the risk attached with investing in the equity market that witnesses constant fluctuation and volatility in returns. Furthermore, retail investors with less accessibility to sensitive information often experience the shock factor that results from changing economic conditions which plunges the market into a downward trend.

It will also help the Asset management companies as well as fund managers to prepare for any economic downturn in advance as they will have a better understanding of how fluctuations in any macroeconomic variable will impact the performance of their fund. The study also aims to compare the extent of impact of the selected macroeconomic variables on three most popular equity fund categories in India- small cap funds, mid cap funds, and large cap funds.

1.2 Supporting Theories

The Capital Asset Pricing Model theory suggested by Sharpe (1964) and Lintner (1965) establish a relationship between systematic risk and expected returns. It proposed a linear relationship between required return on investment and risk. The unrealistic assumptions of CAPM made testing the validity of the model difficult and

determining the beta even more difficult as the model proposed a single factor risk. Moreover, betas do not remain constant and the prices of the securities are often affected by more than factor- macroeconomic variables, investor sentiments, etc. The failure of this theory led to the formation of Arbitrage pricing theory.

The Arbitrage pricing theory was evolved by Stephen Ross in 1976 who argued that in a market where different portfolios with multiple factors (betas) exists, CAPM with its one factor (one beta) may not be able to accurately determine the expected returns of a security. APT allows the actual returns to be influenced by a number of market variables especially macroeconomic variables. They affect the economy as a whole and their fluctuations result in fluctuations of various investment vehicles such as mutual funds. Economic variables have a systematic consequence on stock market returns because economic forces affect discount rates, the ability of the firm to generate cash and future dividend payments (Chen *et al*. 1986; Jecheche 2006; Essays 2018). Thus, APT forms the basis of this study as the multi-factor model allows consideration of macroeconomic variables on the NAV of mutual fund schemes.

2. Empirical Studies

Various number of studies have been conducted to determine the factors that affect the performance of mutual funds, which is a critical factor in selection of funds for investment. Several internal and external characteristics were explored that best explain the volatility and consistent poor performance of the mutual fund market despite being a safer investment vehicle among retail investors. Countless micro and macro-economic factors are also said to have a direct and significant impact on the risk adjusted returns of the capital market. The stock market is a large part of the capital market and are thus affected by the economic landscape of the country. Barakat *et al* Hanafy (2015) discovered a significant impact of inflation, stock market interest rate, money supply and exchange rate on the stock market returns of Tunisia and Egypt. Ouma and Muriu (2014) further concluded that money supply and inflation have a positive impact whereas exchange rate has a negative impact on returns of Kenya stock market.

The impact relationship between macroeconomic variables and stock market returns can be further contrasted in the short run and long run that can help the Government stabilize the volatile economic environment. A long run negative relationship exists between crude oil prices, inflation and stock prices and the relationship remains consistent in the short run as well. Finally short-run estimation confirms a positive and significant relationship for Gold, T-bill rates and Real Effective Exchange Rate (Joshi and Giri, 2015). Yu Hsing (2011) introduced two new variables- world stock market index and world interest rate to the field of study and further confirmed a positive and negative relationship with world stock market index and interest rate respectively.

Given the significant impact of macroeconomic variables on the stock market returns a similar phenomenon maybe observed in the performance of mutual funds. Thus, Kumar and Dash (2008) corroborated that oil prices had the greatest influence on the returns of mutual fund schemes whereas SENSEX returns explained the variance in returns. Equity mutual funds invest majority of the pooled money in stocks and are hence affected by the same factors (*i.e*., macroeconomic factors) that affect the performance of stock markets.

Kariuki (2014) and Pradhum and Joshi (2019) agree that economic indicators like interest rate and money supply have a positive impact on fund returns as these indicators reflect positively on the aggregate demand, consumer spending, and general economic health of the company. Yadav *et al* (2016) and Kariuki (2014) confirmed the existing literature by establishing a negative relationship between exchange rate and mutual fund returns as domestic currency depreciation makes investing in domestic country cheaper which brings an influx of foreign capital into the domestic market. Different schools of thought exist on the relationship between mutual fund returns and inflation. Krishnamurthy (2014) and Kariuki (2014) reported a positive impact of inflation whereas Ansari and Zaman (2021) concluded a negative impact on the Asset Under Management in Pakistan. Gyimah *et al.* (2021) documented a homogeneous long-run significant positive impacts of exchange rate, inflation, T-Bill, GDP whereas negative significant impact of monetary policy rate on the financial performance of mutual funds in Kenya.

Despite the apparent impact of macroeconomic variables on the financial performance of equity funds, microeconomic factors which are internal to an Asset Management Company can also have major impact on their performance. Singal and Manrai (2019) analyzed internal characteristics like fund size, managerial skill, inception date, loads, fees and expenses, diversification as potential determinants for the mutual fund performance in India. Gusni and Hamdani (2018) concluded that stock selection skill is a significant determinant of performance whereas market timing skill and fund size have no significant effect.

In spite the obvious popularity of equity mutual funds, debt funds are now gaining immense traction in the Indian market due to high liquidity and reasonable safety. Babu *et al* (2021) studied the impact of non-economic

factors on debt fund returns and concluded that investors with long term interests should invest in funds with a higher allocation in government securities and those looking for short term returns should invest in funds with higher allocation in Commercial papers and Certificates of Deposits. The rise and fall in NIFTY is equally significant in determining the performance of Indian debt funds as studied by Sharma (2020) who analyzed these funds on Sharpe ratio and Jenson's ratio.

Based on the above discussion, the studies which are related to the influence of economic factors on performance of NAV of equity schemes are still scanty in Indian context. Our contribution to the current literature is three-fold. First, the study adds to the ongoing debate about how macroeconomic variables affect the performance of equity mutual funds in India. Second, new macroeconomic variables have been introduced to the pool of existing variables like FPI, DII, IIP, US Interest rate, and stock market index (NSEI, Nifty MidCap 100, and Nifty SmallCap 100). Third, the degree of impact of select macroeconomic variables on the NAV of equity mutual fund schemes is differentiated and compared between small cap funds, mid cap funds, and large cap funds. Hence, the study has formulated the following research questions to fulfil the above-mentioned research gap.

1.Is there any relationship between the select macroeconomic variables and NAV of mutual fund schemes?

2.To what extent does the select macroeconomic variables impact on small cap, mid cap and large cap fund in short run as well as long run?

3. Research Objectives and Framework

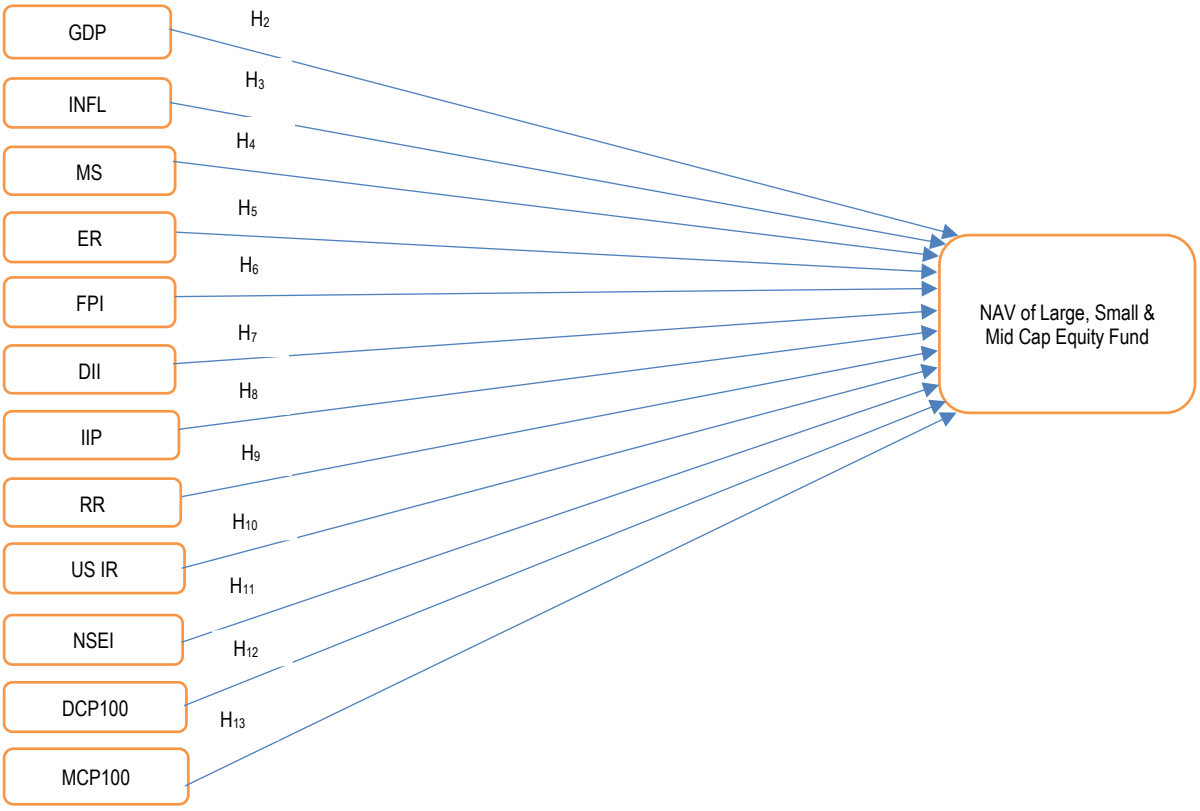
Research Objectives:

1.To understand the volatility of Net Asset Value of mutual fund schemes.

2.To find the relationship between the select macroeconomic variables and mutual funds' performance.

3.To examine the influence of select macroeconomic variables on small cap, mid cap, and large cap funds in short run as well as long run.

Graph 1. Research Framework



3.1 Hypothesis

H_1: There is a significant relationship between macroeconomic variables and Net Asset Value of mutual fund schemes.

H_2: There is a significant influence of Gross Domestic Product on the Net Asset value.

H_3: There is a significant influence of Inflation on the Net Asset value.
H_4: There is a significant influence of Money Supply on the Net Asset value.
H_5: There is a significant influence of Exchange Rate on the Net Asset value.
H_6: There is a significant influence of Foreign Portfolio Investment on the Net Asset value.
H_7: There is a significant influence of Domestic Institutional Investors on the Net Asset value.
H_8: There is a significant influence of Index of Industrial production in India on the Net Asset value.
H_9: There is a significant influence of Repo Rate on the Net Asset value.
H_{10}: There is a significant influence of US Interest Rate on the Net Asset value.
H_{11}: There is a significant influence of Nifty 50 index (NSEI) on the Net Asset value of mid cap funds.
H_{12}: There is a significant influence of Nifty MidCap 100 (DCP100) index on the Net Asset value of mid cap funds.
H_{13}: There is a significant influence of Nifty SmallCap 100 (MCP100) index on the Net Asset value of small cap funds.

3.2 Data and Model Specification

3.2.1 Data and Description of the Variables

The study is descriptive and analytical in nature. Also, used annual time series data on NAV of large cap, mid cap and small cap and the same considered as endogenous variable. Mean of Large Cap, Mid Cap and Small Cap fund NAV is computed from 10 different asset management companies such as ICICI Prudential Bluechip Fund, Franklin India Bluechip Fund, Mirae Asset Large Cap Fund, SBI Blue Chip Fund, Axis BlueChip Fund, HDFC Top 100 Fund, Nippon India Large Cap Fund, Aditya Birla Sunlife Frontline Equity Fund, Canara Robeco BlueChip Equity Fund, UTI Mastershare Unit Scheme. To see the prediction on this, the study has considered selecting macroeconomic variable as exogenous variables. All the exogeneous variables are selected after critical review from the existing studies as well as the reason for association between this. The select macroeconomic variables are Consumer Price Index (INFL) is the proxy of inflation, Exchange Rate (ER), Money Supply (MS), Gross Domestic Product (GDP), Index of Industrial Production (IIP), Effective Federal Funds Rate (USIR), Foreign Portfolio Investment (FPI), Domestic Institutional Investment (DII), Repo Rate (RR), Small Cap (MCP100), Mid Cap (DCP100) and Large Cap (NSEI) market index are considered. Monthly observations are taken above mentioned variables spanning from Jan 2013 to Nov 2022 over a period of 10 years. All the variable data is gathered from Bloomberg terminal source. Raw data of all the variables (except FPI and DII) were converted into natural logs for obtaining uniformity as well as minimizing the problem of heteroscedasticity (Bekhet and Mugableh 2012; Chen *et al.* 1986).

3.2.2 Econometric Model and Methodology

Stationarity checking of all the variables has been done with the help of Augmented Dickey Fuller Test. Further, the characteristic of each variable is described using descriptive statistics. Correlation analysis established in the study to find the relationship between the variables. In addition to this, the basic econometric model is formulated based on the objective of the study which is mentioned below.

$$Largecap = \alpha + \beta_1(INFL)_t + \beta_2(ER) + \beta_3(MS)_{t+} + \beta_4(GDP)_t + \beta_5(IIP)_t + \beta_6(USIR)_t + \beta_7(FPI)_t + \beta_8(DII)_t + \beta_9(RR)_t + \beta_{10}(NSEI)_t + \mu t$$

$$Midcap = \alpha + \beta_1(INFL)_t + \beta_2(ER) + \beta_3(MS)_{t+} + \beta_4(GDP)_t + \beta_5(IIP)_t + \beta_6(USIR)_t + \beta_7(FPI)_t + \beta_8(DII)_t + \beta_9(RR)_t + \beta_{10}(DCP100)_t + \mu t$$

$$Smallcap = \alpha + \beta_1(INFL)_t + \beta_2(ER) + \beta_3(M3)_{t+} + \beta_4(GDP)_t + \beta_5(IIP)_t + \beta_6(USIR)_t + \beta_7(FPI)_t + \beta_8(DII)_t + \beta_9(RR)_t + \beta_{10}(MCP100)_t + \mu t$$

The study applied robust Autoregressive Distributed Lag (ARDL model) introduced by Pesaran and Shin (1999) and further it was extended by Pesaan, Shin, and Smith (2001) to probe the long run and short run impact among the variables. This model has several advantages over the other cointegration model such as Engle and Granger cointegration test and Johansen cointegration test. Also, this model can be applied if the variables are integrated at different level order *i.e* $I(0)$ or $I(1)$. This model is comparatively more efficient in small and limited observations, as is the case of this study.

According to the procedure, the study employed ARDL bound F test to check the presence of long run relationship among the variables. Hypothesis is framed and given below

H_0 – There is no presence of long run relationship ($H_0 = \gamma_1 = 0, \gamma_2 = 0, \gamma_3 = 0$)

H_1 – There is a presence of long run relationship ($H_1 = \gamma_1 \neq 0, \gamma_2 \neq 0, \gamma_3 \neq 0$)

The decision to accept or reject depends on the F statistics value. If the F statistics is greater than the lower 1(0) and upper bound 1(1), then there is a presence of long run relationship among variables and vice versa.

After estimating the co-integration with help of Bound F test, the study applied conditional ARDL to obtain the long run coefficients of each variable. It shows how far each regressor impacting more to determine the net of asset value of the large, mid and small cap fund. To estimate this, the study constructed the Unrestricted Error Correction Model (UECM) of ARDL approach and written as

$$LargeCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnNSEI_{\ t-i} + \varepsilon_t$$

$$MidCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnDCP100_{\ t-i} + \varepsilon_t$$

$$SmallCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnMCP100_{\ t-i} + \varepsilon_t$$

Where, t = time series notation, Δ = First difference operator, β_0 = Intercept, δ= Beta Coefficient, ε_t = Residual or error term

Once the existence of long run equilibrium among the variables proved, the next process is to estimate the short run dynamic coefficients with the help of the error correction model associated with long run estimates obtained from ARDL-UECM approach. The ECM explains how long time it will take to get adjusted or speed of adjustments of dependent variable towards the long run equilibrium. The following equation is constructed for error correction mechanism.

$$LargeCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnNSEI_{\ t-i} + \Phi ECM_{\ t-1} + \varepsilon_t$$

$$MidCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnDCP100_{\ t-i} + \Phi ECM_{\ t-1} + \varepsilon_t$$

$$SmallCap_t = \beta_0 + \Sigma\, \delta_1 INFL_{t-i} + \Sigma\, \delta_2\, lnER_{t-I} + \Sigma\, \delta_3 lnMS_{t-i} + \Sigma\, \delta_4 lnGDP_{t-i} + \Sigma\, \delta_5 \Delta lnIIP_{\ t-i} + \Sigma\, \delta_6 \Delta lnUSIR_{\ t-i} + \Sigma\, \delta_7 \Delta lnFPI_{\ t-i} + \Sigma\, \delta_8 \Delta lnDII_{\ t-i} + \Sigma\, \delta_9 \Delta lnRR_{\ t-i} + \Sigma\, \delta_{10} \Delta lnMCP100_{\ t-i} + \Phi ECM_{\ t-1} + \varepsilon_t$$

where, ECM indicates error correction term, Φ is the speed of adjustment parameter to long run equlibrium and $\delta 1\ \delta_2\ \delta_3\ \delta_4\ \delta_5\ \delta_6\ \delta_7\ \delta_8\ \delta_9\ \delta_{10}\ \delta_{11}$ are short run coefficients.

Further, the stability of long run equilibrium needs the sign of ECT to be negative, but it should be significant. As stated earlier, the study applied residual diagnostics for ARDL model also to check the presence of autocorrelation and heteroscedasticity. In addition to this, study employed the Cumulative Sum of Recursive Residuals (CUSUM) test and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) graph (Brown, Durbin and Evans 1975) to check the stability of the long run relationship associated with short run.

3.3 Empirical Results and Findings

3.3.1 Checking Unit Root Hypothesis

Testing of unit root problem with data on respective variables is always crucial before applying any econometric model. Hence, using of non-stationary time series data leads to the spurious results (Gujarati and Porter 2009). As per the time series assumptions, the absence of unit root which means presence of mean and variance constant over a period in a time series to make the series stationary (Hendry 1995). For checking the unit root test of each variable, the study used Augmented Dickey-Fuller (ADF) test proposed by Dickey and Fuller (1979). The following hypothesis is formulated to check the presence of unit root test of each variable.

3.3.2 Unit Root Test

H_0: Unit root problem in time series data (i.e., $\delta = 0$)
H_1: No unit root problem in time series data (i.e., $\delta < 0$)

The test requires calculation of the regression equation:

$$\Delta X_t = a + \gamma t + \beta X_{t-1} + \sum^{k-1}_{i=1} \Theta_i \Delta X_{t-1} + \varepsilon_t$$

where, a is the constant, and γ is the coefficient of time series. The variable X here represents all the variables under study *i.e.*, DII, ER, FPI, GDP, IIP, INFL, MS, USIR, NAV, and MCP100. In the equation, t is the trend of time, and ε_t is the residual or the error term. Coefficient expressed in the equation indicates that the test for checking unit root is carried out for X_{t-1}. If the coefficient differs significantly from directional bias (that is 0), we retain the alternate hypothesis ($\delta < 0$) and therefore reject the null hypothesis that variable X has a unit root

problem. The findings of the ADF test are summarized and presented in Table 1. From the table: ER, GDP, INFL, MS, USIR, S_NAV, M_NAV, L_NAV, MCP100, DCP100, and NSEI are stationary at first difference and only DII, FPI are stationary at level.

Table 1. Results of the ADF unit root test

Variables	At level		First level of difference		Inference
	t-statistics	Probability	t-statistics	Probability	
Domestic Institutional Investors	-5.3353	0.0000**			Stationary
Exchange Rate	-1.3774	0.5913	-11.0912	0.0000**	Stationary
Foreign Portfolio Investment	-7.0302	0.0000**			Stationary
Gross Domestic Product	-1.9297	0.3177	-12.4157	0.0000**	Stationary
Index of Industrial Production	-4.6109	0.0002**			Stationary
Inflation	0.4407	0.9839	-7.2092	0.0000**	Stationary
Money Supply	1.1364	0.9976	-11.4265	0.0000**	Stationary
Repo Rate (at level)	-1.2692	0.6421	-5.0137	0.0000**	Stationary
US Interest Rate (USIR)	-0.9455	0.7704	-4.0978	0.0014**	Stationary
SNAV	0.6111	0.9895	-9.5873	0.0000**	Stationary
MNAV	0.1751	0.9699	-10.1886	0.0000**	Stationary
LNAV	0.1428	0.9677	-10.9131	0.0000**	Stationary
Nifty Small Cap 100	-0.9834	0.7575	-10.01310	0.0000**	Stationary
Nifty Mid Cap 100	0.1255	0.9664	-10.6657	0.0000**	Stationary
National Stock Exchange India	0.3822	0.9814	-10.8991	0.0000**	Stationary

**5% significance

3.3.3 Descriptive Statistics

Table 2. Summary of Descriptive Statistics

Descriptive Statistics															
Frequencies /Variables	SNAV	GDP	INFL	MS	ER	FPI	DII	IIP	USIR	RR	MCP100	MNAV	LNAV	DCP100	NSEI
Mean	59.22	348.71	137.97	14039830	68.07	5255.90	4661.74	121.33	0.75	6.05	6412.14	312.92	144.48	17070.80	10561.58
Median	54.29	350.49	136.50	13208681	67.49	6582	4102.87	122.5	0.24	6.25	5934.3	310.28	142.91	16721.1	10077.1
Maximum	125.7	432.29	176.70	21051592	82.77	71046.00	55595.18	148.80	3.78	8.00	11289.0	605.09	254.58	32037.90	18758.35
Minimum	18.61	235.38	104.60	8115795	53.26	-118203	- 48319.17	54.00	0.05	4.00	2613.30	102.49	63.50	6589.80	5471.80
Std. Dev.	29.47	50.943	18.84	3835318	6.1626	25398.39	14801.31	12.89	0.87	1.34	2162.4	135.01	51.71	6675.39	3501.58
Skewness	0.93	-0.15	0.28	0.32	-0.07	-0.92	0.45	-1.18	1.13	-0.26	0.38	0.58	0.56	0.63	0.73
Kurtosis	3.07	1.75	2.17	1.91	2.66	6.96	5.80	7.79	3.21	1.93	2.47	2.68	2.54	2.72	2.61
Jarque Bera	17.50	8.17	4.96	7.93	0.54	94.73	43.24	141.61	25.5	7.07	4.27	7.16	7.28	8.30	11.33
Probability	0.01	0.01	0.08	0.01	0.76	0.00	0.00	0.00	0.00	0.02	0.11	0.0	0.02	0.01	0.00

Table 2 represents the summary of descriptive statistics of monthly net asset value and the macroeconomic variables under study.

The average monthly NAV of small cap equity fund schemes and that of all macroeconomic factors are positive. All variables other than FPI and DII have revealed positive minimum values during the study period. Volatility of the variables is identified by standard deviation. Money Supply and FPI have captured the highest volatility whereas US Interest rate and Inflation (as measured by CPI) displayed the lowest volatility. The direction and degree of deviation from the normal distribution curve is explained by skewness and kurtosis. All the variables are fairly symmetrical as these have recorded skewness values between -2 and +2 as per Hair *et al* (2010). The value of kurtosis for SNAV, FPI, DII, IIP, and USIR have leptokurtic distribution (*i.e*, Kurtosis > 3) whereas MNAV, LNAV, GDP, INFL, MS, ER, RR, MCP100, DCP100, and NSEI have a platykurtic distribution. Jarque-Bera value of the variables under study further substantiate the results. All variables except INFL, ER, and MCP100 are not normally distributed as their p value is less than 0.05.

3.4 Correlation Analysis

Table 3. Correlation Matrix

	DER	DGDP	DII	DINFL	DMS	DRR	DUSIR	FPI	IIP	DS_NAV	DM_NAV	DL_NAV	DMC P100	DDC P100	NSEI
DER	1														
DGDP	-0.0570	1													
DII	0.3559*	-0.0693	1												
DINFL	0.0895	-0.3180*	0.0528	1											
DMS	-0.1079	0.1278	-0.0207	-0.0577	1										
RR	-0.0267	-0.0004	-0.0259	0.0918	-0.1282	1									
DUSIR	-0.0894	0.3103*	0.0048	-0.0255	-0.1791	0.5441*	1								
FPI	-0.4444*	0.1805	-0.7863*	-0.0861	0.0312	0.1440	0.1963*	1							
IIP	-0.0700	0.4000*	0.2249*	-0.1943*	0.1351	0.1814*	0.3880*	-0.0350	1						
DS_NAV	-0.3390*	0.0589	-0.5033*	0.1607	0.1111	0.1794	0.1888*	0.5330*	-0.0060	1					
DM_NAV	-0.3775*	0.0269	-0.5616*	0.1684	0.0588	0.2145*	0.2271*	0.5942*	-0.0299	-	1				
DL_NAV	-0.4428*	-0.0426	-0.5974*	0.1817*	0.0051	0.1985*	0.2174*	0.5819*	-0.0452	-	-	1			
DMCP100	-0.4165*	-0.0457	-0.5242*	0.1845	0.0003	0.1146	0.2414	0.5431*	-0.0300	0.9336*	-	-	1		
DDCP100	-0.3894*	-0.0457	-0.5616*	0.1845	0.0003	0.1792	0.2347*	0.5732*	-0.0300	-	0.9680*	-	-	1	
NSEI	-0.4783*	-0.0457	-0.5779**	0.1845**	0.0003	0.1812*	0.2414*	0.5670*	-0.0300	-	-	0.9710*	-	-	1

*5% significance

Table 3 summarizes the results of correlation analysis. Correlation between the monthly net asset value and macroeconomic variables are studied through the correlation matrix. DII is positively correlated with DER (r = 0.3559, p<0.05) and IIP (r = 0.2249, p<0.05) whereas negatively correlated with DS_NAV (r = -0.5033, p<0.05), DMCP100 (r = -0.5242, p<0.05), and FPI (r = -0.7863, p<0.05). DINFL is negatively correlated with DGDP (r = -0.318, p<0.05) and IIP (r = -0.1943, p<0.05). DS_NAV exhibits a positive correlation with DMCP100 (r = 0.9336, p<0.05), DUSIR (r = 0.1888, p<0.05), and FPI (r = 0.533, p<0.05) but negative correlation with DER (r = -0.339, p<0.05). DMCP100 is negatively correlated with DER (r = -0.4165, p<0.05) but positively correlated with FPI (r = 0.5431, p<0.05). DUSIR revealed a positive correlation across DGDP (r = 0.3130, p<0.05), FPI (r = 0.1963, p>0.05), DRR (r = 0.5441, p<0.05) and IIP (r = 0.388, p<0.05). DM_NAV displayed a negative correlation with both DER (r = -0.3775, p<0.05) and DII (r = -0.5616, p<0.05) and a positive correlation with DDCP100 (r = 0.968, p<0.05), DUSIR (r = 0.2271, p<0.05), and FPI (r = 0.5942, p<0.05). DDCP100 is positively correlated with DUSIR (r = 0.2347, p<0.05) and FPI (r = 0.5732, p<0.05) and negatively correlated with DER (r = -0.3894, p<0.05) and DII (r = -0.5438, p<0.05). DL_NAV exhibited a positive correlation across INFL (r = 0.1817, p<0.05), DNSEI (r = 0.971, p<0.05), DUSIR (r = 0.2174, p<0.05), DRR (r = 0.1985, p<0.05) and FPI (r = 0.5819, p<0.05) while negative correlation across DER (r = -0.4428, p<0.05) and DII (r = -0.5974, p<0.05). DNSEI is additionally positively correlated with INFL (r = 0.1845, p<0.05), DRR (r = 0.1812, p<0.05), and FPI (r = 0.567, p<0.05) but negatively correlated with DER (r = -0.4783, p<0.05) and DII (r = -0.5779, p<0.05). Overall correlation coefficient results show moderate correlation across the macroeconomic factors. As a whole, the three types of funds show varying levels of correlation with almost the same variables such as market indices as the NAV reflects equity market sentiments captured by market indices. The NAV of all the three funds also show a positive and negative correlation with FPI and ER respectively. Inflation is additionally positively correlated to only the NAV of large cap funds.

3.5. Autoregressive Distributed Lag Model (ARDL)

3.5.1 Small cap funds

Table 4 summarizes the results of the Bound F test at three critical bounds- 90%, 95%, and 99%. The study of Narayan (2004) discusses two sets of critical bound values *i.e*., at upper limit and lower limit. The first set

assumes that all regressors are I (1) whereas the second set assumes they are I (0) which results in a set of three conditions.

Table 4. Bound F test Table

F-statistics	90%			95%			99%	
	I (0)	I (1)		I (0)	I (1)		I (0)	I (1)
62.2783	1.76	2.77		1.98	3.04		2.41	3.61

A F-test statistic value higher than the upper limit value *i.e.*, I (1) implies the mere presence of long-run co-integration whereas a value lesser than the lower limit *i.e.*, I (0) conforms absence of long-run co-integration. Finally, if the F test lies between the upper and the lower limit than it can be concluded that the data is inconcludable and inconsistent. Table 4 exhibits the value of F-statistic as 62.2783 which is much greater than the upper limit *i.e.*, 1.98 at a 5% significance. Hence, we can conclude that there is a long-run co-integration in the macroeconomic data. The following section substantiates the long run coefficients.

Table 5. Estimated Long run coefficients using the ARDL approach (Small Cap fund)

Dependent Variable: DS_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
Constant	-2.4320	1.6868	-1.4418	0.1525
DII	0.0012	0.0017	0.6908	0.4912
FPI	0.0008	0.0010	0.8565	0.3937
IIP	0.0191	0.0142	1.3459	0.1814
DER	0.7068	0.2114	3.3425**	0.0012**
DGDP	-0.0030	0.0097	-0.5055	0.6143
DINFL	-0.0067	0.1768	-0.0381	0.9696
DMS	0.0002	0.0001	2.3355**	0.0215**
DRR	1.4904	1.0371	1.4371	0.1538
DNIFSMCP100	0.0083	0.0007	11.6317**	0.0000**
DUSIR	-1.6071	1.2661	-1.2693	0.2073
F-statistic				62.2783

** denotes 5% significance level

Results obtained in the long run to determine the impact of macroeconomic variables on NAV of small cap funds are presented in Table 5. The estimated coefficients of the long run relationship show significant impact of few macroeconomic variables on the monthly NAV of small cap equity fund schemes. The coefficient of Exchange Rate (USD/INR) is positive and statistically significant in the determination of NAV. Similarly, Money supply has a very significant impact on the NAV of small cap equity funds. This is not surprising as increase in money circulating in the economy facilitates investment among retail investors and mutual funds being the top choice of investment among the retail investors experience a bullish trend in NAV. Lastly, NIFTY Smallcap 100 also has a positive coefficient and significant impact on NAV as the NIFTY index captures movement of stock prices of the top 100 small cap companies in India. Thus, the market index often mimics the movement of underlying stock prices and thus net asset value of equity fund schemes that contribute majority of their funds in small cap companies are significantly impacted by the market index.

The results of the short run dynamic coefficients associated with long run relationships obtained from ECM equation are given in table 6. The short run determinants vary from the long run determinants.

Table 6. Estimated Coefficients of the Short run Dynamic Error correction Model (Small Cap fund)

Dependent Variable: DS_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
D (DS_NAV (-1))	-0.0717	0.0260	-2.7578	0.0069**
D (DII)	-0.0024	0.0010	-2.2315	0.0279**
D (DER)	0.3554	0.0657	5.4059	0.0000**
D (DUSIR)	0.5462	0.7915	0.6901	0.4917
ECM	-0.8205	0.0284	-28.8018	0.0000
R-squared	0.9477	F-statistic		62.2783
Adjusted R-squared	0.9459	Akaike info criterion		3.1140
Durbin-Watson stat	1.8830			

** denotes 5% significance level

Serial Correlation Test: Breusch Godfrey LM 0.5779 (0.5630) Heteroskedasticity Test: Breusch-Pagan-Godfrey Test 1.2931 (0.6422)

Table 6 summarizes the estimated coefficients of the short run relationship. Out of the 10 select macroeconomic variables, only two variables have a significant impact on the determination of NAV in the short run. Domestic Institutional Investment has a negative coefficient and has a very significant impact. Exchange rate has a positive coefficient and is statistically significant in determining the movement of NAV of small cap schemes. However, coefficients of US Interest rate are not significant at 5% level though with a positive sign.

The equilibrium error correction term coefficient has a negative *i.e.*, -0.82 and significant value which clearly explains speed of adjustment towards long run equilibrium by 82 percent. This implies that the mutual fund market displays a high speed of adjustment to equilibrium after a shock. Thus, 82 percent of disequilibria from previous year's shock converge back to long run equilibrium in the current year. Stability and diagnostic tests are conducted to validate the performance and accuracy of model in predicting NAV of small cap schemes. The series association LM test displays a chi-square value of 0.5779 with a confidence value of 0.5630 thereby retaining the null hypothesis *i.e.*, there is no auto correlation. The tests of heteroscedasticity check reveals that the data does not exhibit any autoregressive conditional heteroscedasticity (1.2931) with a probability value of 0.6422.

Figure 1. CUSUM plots at 5% L.O.S

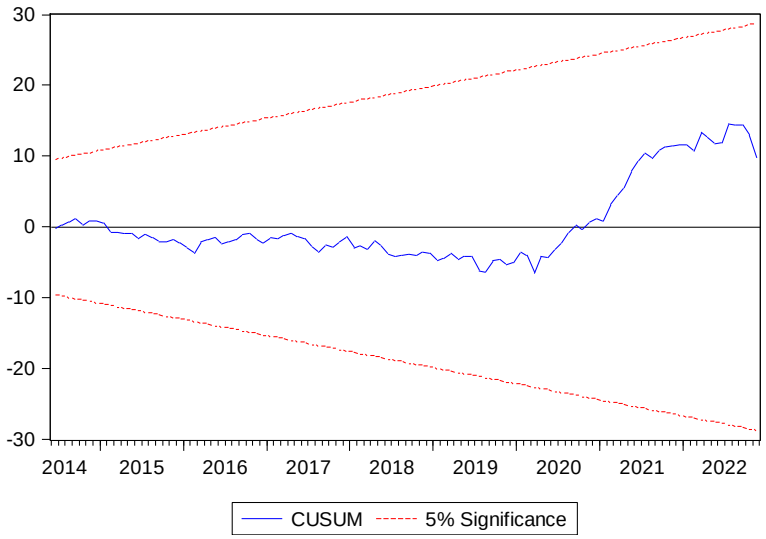


Figure 1 displays the CUSUM plot for long term stability tests of ARDL Error Corrections pattern. If the plot estimate lies within the critical 5 percent of the point of significance of crucial limits (*i.e.*, between the upper and lower limits), then the model is stable. Thus, estimates of CUSUSM lies far below the critical 5 percent that indicates robust coefficients in both long run and short run in the ARDL-ECM.

3.5.2 Mid cap funds

Table 7. Bound F test Table

F-statistics	90%			95%			99%	
	I (0)	I (1)		I (0)	I (1)		I (0)	I (1)
263.3544	1.76	2.77		1.98	3.04		2.41	3.61

Table 7 exhibits the value of F-statistic as 263.3544 which is greater than the upper limit *i.e.*, 1.98 at a 5% significance. Hence, it can be concluded that there is a long-run co-integration in the macroeconomic data. The following section substantiates the long run coefficients.

Results obtained in the long run to determine the impact of macroeconomic variables on NAV of mid cap funds are presented in table 8. The estimated coefficients of the long run relationship show significant impact of very few macroeconomic variables on the monthly NAV of mid cap equity fund schemes. The extent of impact is greater in small cap funds than mid cap funds. Only Nifty Midcap 100 shows a significant positive impact in the long run on the NAV of mid cap schemes. The market index often mimics the movement of underlying stock prices and thus net asset value of equity fund schemes that contribute majority of their funds in mid cap companies are significantly impacted by the market index.

Table 8. Estimated Long run coefficients using the ARDL approach (Mid Cap fund)

Dependent Variable: DM_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
Constant	-1.1351	4.8334	-0.2348	0.8148
DII	-0.0015	0.0048	-0.3221	0.7480
FPI	0.0040	0.0030	1.3221	0.1891
IIP	0.0166	0.0398	0.4183	0.6766
DER	-0.4365	0.7092	-0.6154	0.5396
DGDP	0.0030	0.0305	0.0999	0.9206
DINFL	0.4004	0.5086	0.7872	0.4330
DMS	-0.0008	0.0003	-0.2745	0.7842
DRR	6.4699	5.1052	1.2673	0.2080
DNIFMDCP100	0.0156	0.0008	19.1864**	0.0000*
DUSIR	-4.3085	3.7132	-1.1603	0.2487
F-statistic				263.3544

** denotes 5% significance level

Table 9. Estimated Coefficients of the Short run Dynamic Error correction Model (Mid Cap fund)

Dependent Variable: DM_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
D (DER)	0.0947	0.2479	0.3820	0.7032
D (DER (-1))	0.8730	0.2397	3.6298	0.0004**
D (DRR)	8.6042	2.2336	3.8521	0.0000**
D (DRR (-1))	6.2340	2.2667	2.7520	0.0071
ECM	-1.0011	0.0169	-59.2273	0.0000
R-squared	0.9739	F-statistic		263.3544
Adjusted R-squared	0.9730	Akaike info criterion		5.6435
Durbin-Watson stat	2.0704			

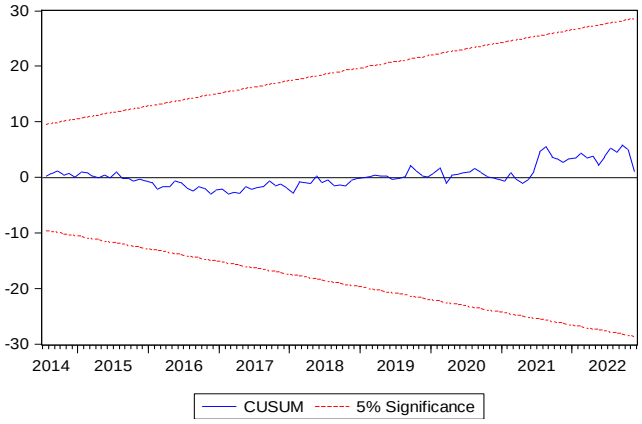
** denotes 5% significance level

Serial Correlation Test: Breusch Godfrey LM 0.9720 (0.3819) Heteroscedasticity Test: Breusch-Pagan-Godfrey Test 1.6829 (0.0708)

Table 9 summarizes the estimated coefficients of the short run relationship. Out of the 10 select macroeconomic variables, only two variables have a significant impact on the determination of NAV in the short run. Following the short run results of small cap schemes, exchange rate has a negative coefficient and has a very significant impact on the NAV of mid cap schemes too. Repo Rate has a positive coefficient and is statistically significant in determining the movement of NAV.

The equilibrium error correction term coefficient has a negative *i.e.*, -1.001 and significant value which clearly explains speed of adjustment towards long run equilibrium by 100 percent. This implies that the mutual fund market displays a high speed of adjustment to equilibrium after a shock.

Figure 2. CUSUM plots at 5% L.O.S



Stability and diagnostic tests are conducted to validate the performance and accuracy of the model in predicting NAV of small cap schemes. The series association LM test displays a chi-square value of 0.9720 with a

confidence value of 0.3819 thereby retaining the null hypothesis *i.e.*, there is no auto correlation. The tests of heteroscedasticity check reveals that the data does not exhibit any autoregressive conditional heteroscedasticity (1.6829) with a probability value of 0.0708.

Figure 2 displays the CUSUM plot for long term stability tests of ARDL Error Corrections pattern. If the plot estimate lies within the critical 5 percent of the point of significance of crucial limits (*i.e.*, between the upper and lower limits), then the model is stable. Thus, estimates of CUSUSM lies far below the critical 5 percent that indicates robust coefficients in both long run and short run in the ARDL-ECM.

3.5.3 Large Cap funds

Table 10 exhibits the value of F-statistic as 62.2783 which is greater than the upper limit *i.e.*, 1.98 at a 5% significance. Hence, we can conclude that there is a long-run co-integration in the macroeconomic data. The following section substantiates the long run coefficients.

Table 10. Bound F test Table

F-statistics	90%			95%			99%	
	I (0)	I (1)		I (0)	I (1)		I (0)	I (1)
12.0592	1.76	2.77		1.98	3.04		2.41	3.61

Results obtained in the long run to determine the impact of macroeconomic variables on NAV of small cap funds are presented in Table 11.

Table 11. Estimated Long run coefficients using the ARDL approach (Large Cap fund)

Dependent Variable: DL_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
Constant	-0.3454	1.7533	-0.1970	0.8442
DII	-0.0029	0.0017	-1.6268	0.1070
FPI	0.0002	0.0012	0.2477	0.8048
IIP	0.0031	0.0148	0.2124	0.8322
DER	-0.1292	0.1968	-0.6566	0.5129
DGDP	0.0030	0.0305	0.0999	0.9206
DINFL	0.0715	0.1759	0.4067	0.6851
DMS	0.0002	0.0001	1.8724	0.0641
DRR	1.5519	1.0308	1.5054	0.1354
DNSEI	0.0131	0.0008	16.3106**	0.0000**
DUSIR	-0.5893	1.1190	-0.5266	0.5956
F-statistic				12.0592

** denotes 5% significance level

The estimated coefficients of the long run relationship show significant impact of very few macroeconomic variables on the monthly NAV of large cap equity fund schemes. The extent of impact is greater in small cap funds than large cap funds. Only Nifty 50 shows a significant positive impact in the long run on the NAV of mid cap schemes. The market index often mimics the movement of underlying stock prices and thus net asset value of equity fund schemes that contribute majority of their funds in large cap companies are significantly impacted by the market index. None of the other macroeconomic variables are statistically significant in determining the NAV in the long run.

Table 12. Estimated Coefficients of the Short run Dynamic Error correction Model (Large Cap fund)

Dependent Variable: DL_NAV				
Regressor	Coefficient	Standard Error	t-Statistic	Prob (tstatistic)
D (DER)	0.0670	0.0924	0.7251	0.4701
D (DGDP)	-0.0013	0.0066	-0.2099	0.8341
D (DGDP (-1))	0.0152	0.0062	2.4390	0.0165**
D (DMS)	0.0001	0.0000	0.1375	0.8909
D (DNSEI)	0.0125	0.0002	50.5550	0.0000**
ECM	-1.1395	0.0898	-12.6867	0.0000
R-squared	0.9789	F-statistic		12.0592
Adjusted R-squared	0.9777	Akaike info criterion		3.7310
Durbin-Watson stat	1.8860			

** denotes 5% significance level

Serial Correlation Test: Breusch Godfrey LM 0.0703 (0.9321) Heteroscedasticity Test: Breusch-Pagan-Godfrey Test 1.2746 (0.2251)

Table 12 summarizes the estimated coefficients of the short run relationship. Out of the 10 select macroeconomic variables, only two variables have a significant impact on the determination of NAV in the short run. Unlike small cap and mid cap equity schemes, Gross Domestic Product has a positive coefficient and has a very significant impact on the NAV of mid cap schemes too. Nifty 50 has a positive coefficient too and is statistically significant in determining the movement of NAV.

The equilibrium error correction term coefficient has a negative *i.e.*, -1.1395 and significant value which clearly explains speed of adjustment towards long run equilibrium by 113 percent. This implies that the mutual fund market displays a high speed of adjustment to equilibrium after a shock. Stability and diagnostic tests are conducted to validate the performance and accuracy of model in predicting NAV of small cap schemes. The series association LM test displays a chi-square value of 0.0703 with a confidence value of 0.9321 thereby retaining the null hypothesis *i.e.*, there is no auto correlation. The tests of heteroscedasticity check reveals that the data does not exhibit any autoregressive conditional heteroscedasticity (1.2746) with a probability value of 0.2251.

Figure 3. CUSUM plots at 5% L.O.S

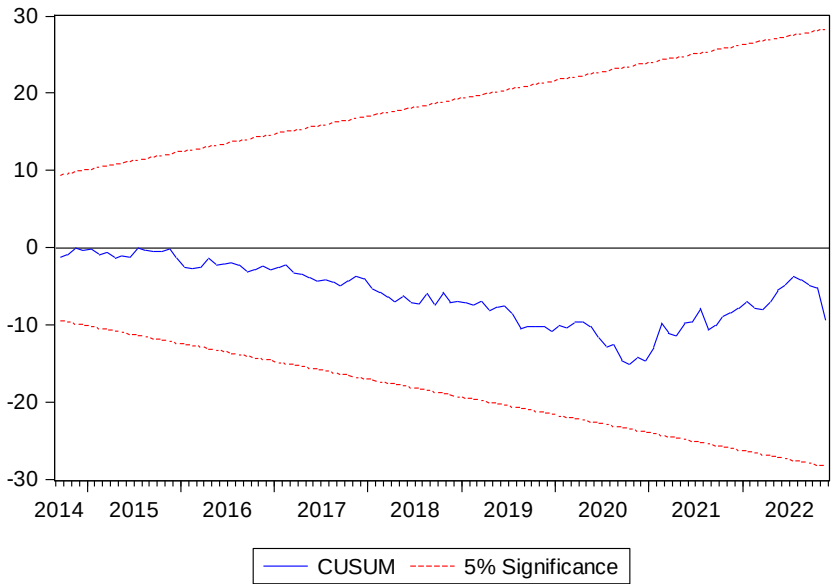


Figure 3 displays the CUSUM plot for long term stability tests of ARDL Error Corrections pattern. If the plot estimate lies within the critical 5 percent of the point of significance of crucial limits (*i.e.*, between the upper and lower limits), then the model is stable. Thus, estimates of CUSUSM lies far below the critical 5 percent that indicates robust coefficients in both long run and short run in the ARDL-ECM.

3.6. Scope and Limitation

The study is limited to a period of ten years, starting from 1st January 2013 to 31st October, 2022. Firstly, the duration of study can be increased to check the influence in the long run and enhance the accuracy of the model. Secondly, only twelve macroeconomic variables have been considered and there is a scope for including more variables such as unemployment rate and gross domestic savings rate. Thirdly, the study only includes equity mutual funds and there is future scope to study the impact of macroeconomic variables on debt funds, thematic funds, and passive funds to make the model more robust.

Implications and Conclusion

Policy Recommendations

The findings and conclusions of the study have substantiated the importance of macroeconomic variables in determining the Net Asset Value of mutual funds given their significance in the long run as well as the short run. These findings are of critical importance to the following stakeholders- Government, Fund Managers, and Investors as it helps each group make informed investment decisions. The Indian Government should take steps to regulate the significant macroeconomic variables such as Exchange rate, GDP, money supply to facilitate

economic development through increased investment in the capital markets- especially mutual funds. The fund managers can also use the study findings to either adopt an active management or passive management style based on the movement of the market indices. Retail investors can further track macroeconomic trends to absorb the shock factor better and decide their preferred mutual fund type- small cap, mid cap, and large cap fund based on their risk appetite.

Stimulating the economy when GDP is recording single digit or negative number through higher consumer spending is an excellent way of enhancing mutual funds returns- especially for large cap funds. Lenient fiscal policy through tax cuts and tax rebates during economic downturns, facilitating consumer spending by reducing interest rates, and stimulating the economy with deregulation in certain industries can help improve the economic environment of the country. Government spending on local infrastructure projects will not only increase GDP but also increase productivity which enables business to operate more efficiently.

Increasing exchange rate (USD/INR) *i.e*., depreciates Indian Rupee relative to the strong US Dollar, increases the performance of domestic mutual funds as it incentivizes local as well as foreign investors to invest in the local currency as it is cheaper than the home currency for foreign nationals. Thus, government often uses expansionary fiscal policies to weaken the INR against USD to increase FPI and FDI and invariably make a bullish move on the NAV. Finally, the significant positive impact of money supply implies that a general increase of money circulated in the economy enhances the performance of equity mutual funds. On one hand, Asset Under Management increases as households invest excess income in relatively less risky instruments like Fixed deposits, bonds, and Mutual funds. The Government can increase money circulating in the economy by injecting liquidity in the market by lowering reserve requirements of the banks that allows greater credit utilization.

Conclusion

Building on the Arbitrage Pricing Theory proposed by Stephen Ross in 1976 that market returns can be expressed as a function of macroeconomic variables; the study examines the most important impactful variables in determining the mutual fund returns. There are various studies that have examined the impact of macroeconomic variables on equity mutual funds in the Indian context but very few have compared the degree of impact between small cap, mid cap, and large cap funds. Our study further contributes to the present literature by introducing new investigatory variables such as- FPI, DII, Nifty SmallCap 100, Nifty MidCap100, NSEI, and US Interest Rate.

The results from the study have dual benefits as it allows the investors and fund managers to make informed investment decisions and facilitates rational economic policy making. In the paper, we investigated the impact of ten key macroeconomic variables on the monthly Net Asset Value of three most common equity funds in the Indian Capital Market- small cap funds, mid cap funds, and large cap funds over the period of 2013 to 2022 in India. The macroeconomic variables under study are- CPI as a proxy of inflation, Exchange Rate (ER), Money Supply (M3), Gross Domestic Product (GDP), Index of Industrial Production (IIP), EFFR, Foreign Portfolio Investment (FPI), Domestic Institutional Investment (DII), Repo Rate (RR), Nifty SmallCap 100, Nifty MidCap 100 and NSEI market index. We performed descriptive statistics to scrutinize the characteristics of data and correlation analysis to explore the co-movement of monthly Net Asset value of each fund category with the key macroeconomic variables. The results were further differentiated in the long run and short run using ARDL-UECM model to determine and compare the degree of impact between the three kinds of schemes.

Findings support the present literature that macroeconomic variables have a significant impact on the returns of mutual fund schemes in the Indian context. Exchange rate has a significant positive long run as well as short run impact on the returns of small cap funds whereas it only has a short run positive impact on mid cap funds and no impact on large cap funds. The market indices- Nifty SmallCap100, Nifty MidCap100, and NSEI have significant positive long run impact on the respective funds. Domestic Institutional Investors' trading activity and money supply has a significant negative and significant positive impact respectively on the returns of small cap funds. Repo rates have a significant short run negative impact on the returns of mid cap funds while GDP has a significant positive short run impact on the returns of large cap funds as corporate earnings increase which makes it bullish on NAV. Thus, our results add to the pool of literature that macroeconomic variables and especially market indices are significant determinants of Mutual fund NAV and their impact must thus be factored in by the fund managers to improve future fund performance.

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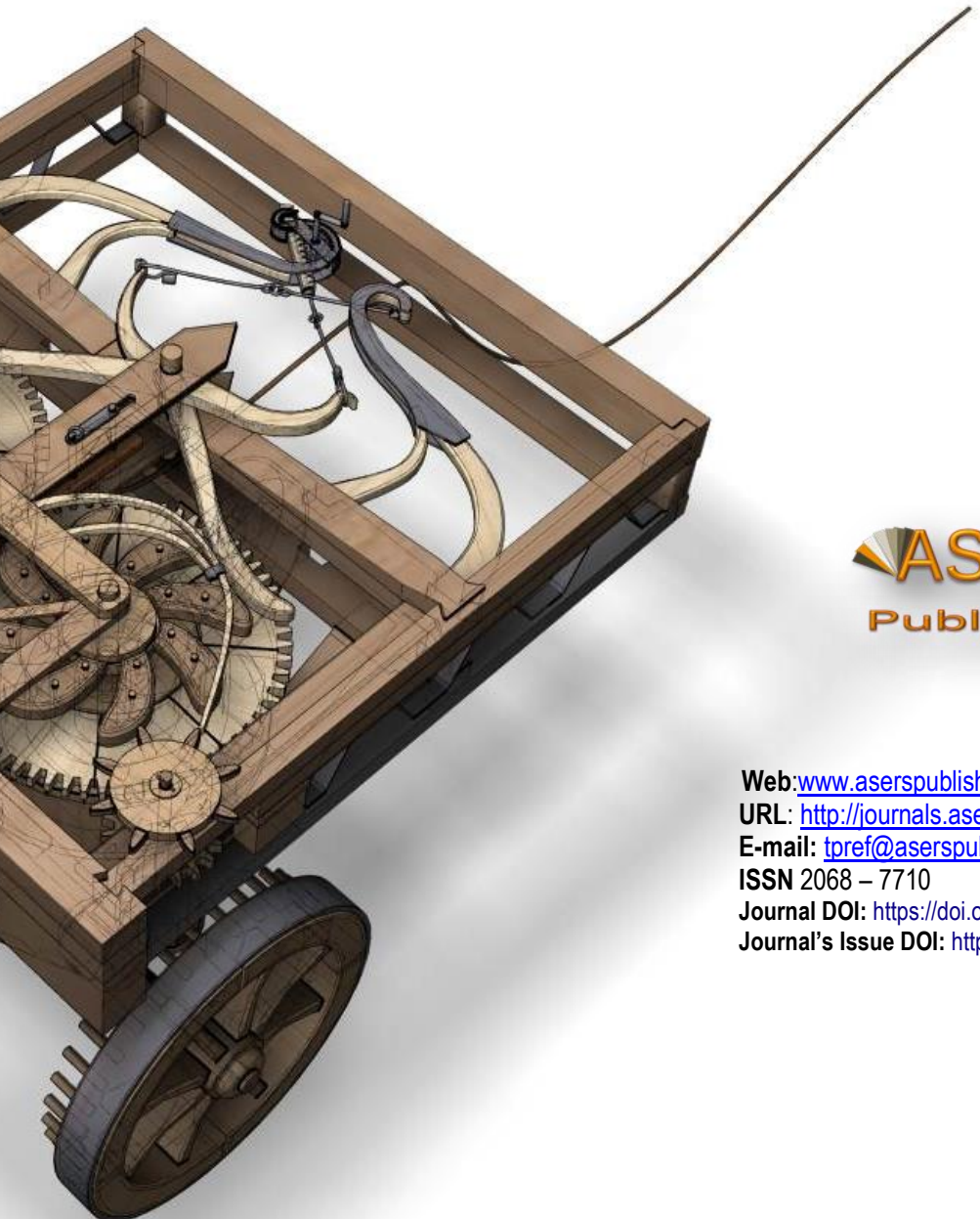

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