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## INDIAN MUTUAL FUND INDUSTRY: IS 2014 A TURNING POINT?

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### ABSTRACT

Indian Mutual Fund Industry has experienced a nearly 40-fold increase in assets under management since the start of the 21<sup>st</sup> century, which has implications for the financial sector and the wider economy. Using structural break models, we identify 2003-08 as a nascent growth phase followed by a tepid growth phase in the post-global financial crisis period. Since 2014, the industry has experienced accelerated growth, outpacing global peers, driven by consistent individual investor inflows in equity and hybrid categories. Supportive regulatory policies introduced in 2012-13, we argue, have boosted the industry's growth.

*Keywords: Financial markets, Mutual funds; India.*

**JEL Classifications: G11; G14; G23; G41.**

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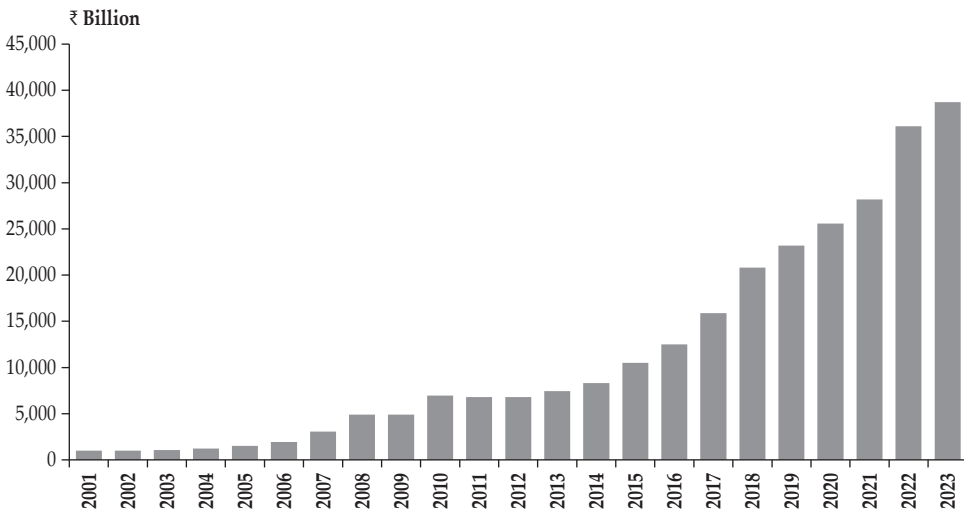
## I. INTRODUCTION

The financial system plays a critical role in a country's economic growth by mobilising and channelling the savings of the general public into productive investments. In India, the capital market, money market, and financial services industry have experienced robust growth due to progressive reforms in economic policies. In the financial services sector, one of the successful stories in recent years has been the impressive growth of the mutual fund industry. A mutual fund may be defined as "a fund established in the form of a trust to raise money through the sale of units to the public or a section of the public under one or more schemes for investing in securities including money market instruments or gold or gold related instruments or real estate assets" (SEBI, 1996). More precisely, mutual funds may also be considered a regulated form of collective investment scheme, as these funds are legally permitted to collect savings from the public for investments in a predominantly diversified portfolio of tradable securities (World Bank Group, 2015).

The Indian mutual fund industry has experienced a nearly 40-fold increase in Assets Under Management (AUM) since the start of the 21<sup>st</sup> century (Figure 1). These two decades also included a period of extreme stress in the global financial markets owing to the 2007-08 Global Financial Crisis (GFC), making this even more remarkable. Prior to the GFC, the nascent Indian mutual fund industry experienced strong growth, but after the GFC, it entered a phase of tepid growth. However, the popularity of mutual funds has increased dramatically in recent years, more specifically since 2014, which is also reflected in the sharp increase in AUM.

**Figure 1.**  
**AUM of the Indian Mutual Fund Industry**

This figure shows the average annual AUM of Indian mutual funds from the financial year FY01 to FY23.

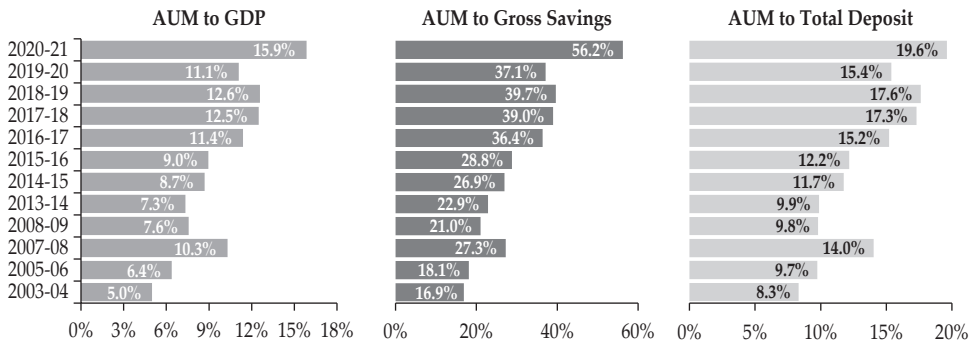


Sources: Association of Mutual Funds in India (AMFI) and Authors' Calculations.

With the accelerated growth of the mutual fund industry, the relative size of AUM in terms of major economic variables, such as GDP, gross savings, and total deposits with banks, has also registered a noticeable improvement in recent years (Figure 2). This has widespread implications for not only the stakeholders including households, corporates, and other financial institutions like commercial banks, but also the financial system and even the economy as a whole.

**Figure 2.**  
**Relative Size of Mutual Fund AUM in terms of Major Economic Variables**

This figure shows the ratio of AUM of Indian mutual funds to GDP, Gross Savings (which includes savings of private, public, and household sectors), and Total Deposits (which is the sum of demand deposit and time deposit) from financial year FY2003-04 to FY2020-21.



Sources: Reserve Bank of India, AMFI, and Authors' calculations.

A positive correlation between mutual fund flows and subsequent returns, especially at the macro level has been found in the literature (Oh and Parwada, 2007; Warther, 1995). In the case of an emerging economy such as India, if mutual funds influence market trends, this needs to be seen *vis-à-vis* Foreign Portfolio Investors (FPIs), who are the other major market influencers (Bose, 2012). If mutual funds exhibit independent or contrarian behaviour *vis-à-vis* FPIs, they can reduce the influence of FPIs' actions on the domestic market or better act as a counterweight. This may be particularly beneficial during times of crisis when large FPI outflows can adversely impact stock markets (Prabheesh, 2020; Prabheesh *et al.*, 2023). Mutual funds can also help in the development and maturing of certain financial markets including commercial paper, commercial deposit, and even equity markets. Some have argued that the expansion of the mutual fund industry in the US from the 1980s onwards led to the creation and expansion of mortgage-backed securities and securitisation of consumer loans (Sellon, 1992). Further, the literature also argues that mutual fund investors are forward-looking, thus mutual fund inflows can also be an important tracker to measure economic sentiment (Ferson and Kim, 2012; Jank, 2012; Qureshi *et al.*, 2019).

The rapid expansion of the mutual fund industry has wider ramifications and implications for the economy. From the perspective of investment needs, mutual funds can act as an alternative source of funding for corporates both through equity route (IPOs and FPOs) and corporate debt (Sellon, 1992). Money market

funds (mutual funds that invest predominantly in short-term debt instruments) can serve short-term liquidity needs (Edwards and Mishkin, 1995). Thus, mutual funds can as an alternative conduit for converting household savings into financial investment, thereby fuelling the real economy and acting as an essential link in the financial market chain (Costanzo, 2011; Mack, 1993).

The rising influence of mutual funds has implications for other financial intermediaries including commercial banks, life insurance agents, and other Non-Banking Financial Companies (NBFCs). It is expected to increase competition for savings of households, thereby potentially impacting the lending capacity and also the cost of funds (Edwards, 1994; Hale, 1994; Mack, 1993). It would also impact the lending universe as profitable companies may prefer to raise money through mutual funds via capital markets. Thus, it could potentially impact the balance sheet, profitability, and even the risk profile of the traditional financial intermediaries leading to financial stability risks (Edwards, 1994; Edwards and Mishkin, 1995; Sellon, 1992).

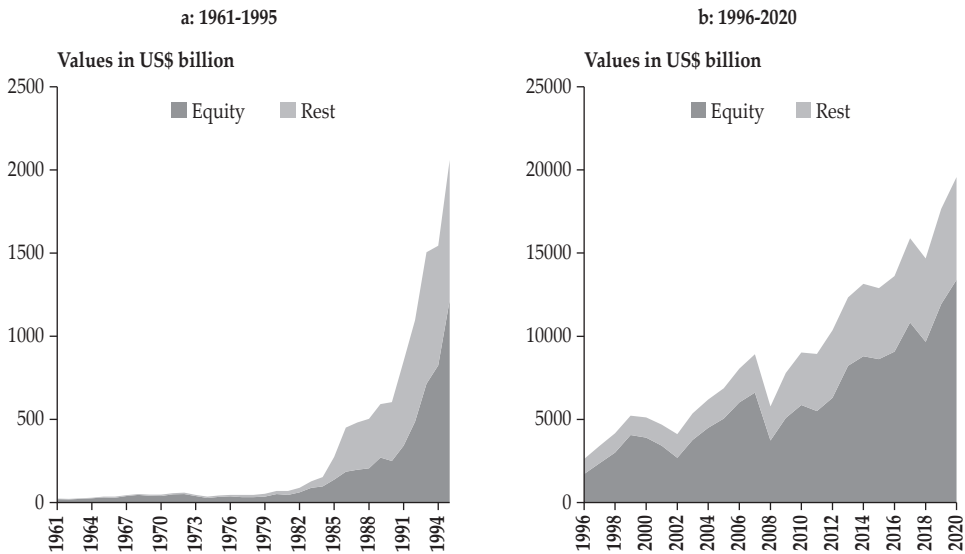
Concerns have also been raised over the impact of a burgeoning mutual fund industry on financial and economic stability. It has been argued that the growth of mutual funds, which are institutional investors with enormous resources compared to individual investors, often leads to increased trading activity in financial markets, growth in usage of financial derivatives, and increased cross-border equity holdings (Edwards, 1994). This may lead to increased volatility in financial markets, creation of speculative bubbles, and increased contagion from global risks. Further, a sharp drop in stock or bond prices could lead to a domino effect by setting off redemptions by fund investors, which in turn would exert further downward pressure on asset prices, leading to further redemptions and therefore a downward spiral. Thus, some funds could face bank-like 'runs' and engage in asset 'fire sales', threatening overall financial stability (Price and Schwartz, 2015). This, combined with the fact that households have shifted away from more traditional forms of savings, such as bank deposits, real estate, and gold, towards equity and hybrid category mutual funds could lead to large adverse wealth effects, which in turn could pull down the aggregate demand for real goods in the economy (Hale, 1994; Kaufman Henry, 1994). Thus, a sharp correction in assets could turn into a full-blown economic crisis. Furthermore, it can also impact price stability, as post-GFC, it has been shown that financial instability may have large negative feedback effects through various channels on price stability and, thus, economic activity (Smets, 2018). However, others have contested these claims to be unfounded and even argued for a stabilising role played by mutual funds (Engen and Lehnert, 2000; Morgan, 1994). Mutual funds, by their inherent design, diversify risk across a large range of market participants, therefore enhancing financial stability in the economy (Price and Schwartz, 2015). Further, the assumption that individual investors are unaware of market risks or likely to engage in panic sales has also been challenged by others. Even the impact through the wealth effect has been contested on the grounds that the impact is not as large as feared (Morgan, 1994).

A lot of the above research was in response to the rapid expansion of the US mutual fund industry post-1985 when its AUM grew 10-fold over a period of just 10 years (Figure 3a). However, limited research has been undertaken about

mutual fund industry dynamics outside the US, despite the rise of mutual funds in emerging economies including India in recent decades (Khorana *et al.*, 2005; Oh and Parwada, 2007). Furthermore, the sustained increase in the AUM of the U.S. mutual fund industry since 1995 shows that the robust growth observed in the Indian mutual fund industry in the last 10 years may just be the start of the increase in mutual funds (Figure 3b).

**Figure 3.**  
**Development of the US Mutual Fund Industry**

This figure shows the rise in AUM of the US mutual funds from 1961 to 2020.



Source: Federal Reserve Bank of St. Louis.

As the Indian mutual fund industry is also witnessing a similar growth trajectory, a deeper analysis is warranted, especially with respect to the drivers and triggers for the mutual fund industry in India. Analysing the events which can alter the growth trajectory of mutual funds will help in understanding how the investors have reacted to such events in the past while also outlining guidance for the future regarding the impact of such events.

The recent literature on mutual funds in India, post-2014, has broadly looked at mutual funds in India from a micro-perspective of fund level flows, performance, etc. (Ghosh *et al.*, 2014; Gupta *et al.*, 2019; Malhotra and Sinha, 2021; Santhi, 2014; Das *et al.*, 2023). Another set of studies, which have looked at drivers of mutual funds or factors influencing investor preference towards mutual funds have relied on small survey group approach (Das and Ali, 2020; Deb and Singh, 2018; Srivastava, 2018). A few studies that have studied the Indian mutual fund industry at a macro level have done it prior to 2014 (Khorana *et al.*, 2005; Narayan *et al.*, 2014). Therefore, there exists a gap in the literature regarding the analysis of the factors that may have driven the recent robust growth in Indian mutual funds.

Against this backdrop, this paper attempts to analyse the dynamics of India's mutual fund industry over the past two decades, with a special focus on identifying the structural changes which have been witnessed by the mutual fund industry and outlining the plausible causes of such structural breaks. Accounting for structural change has always been an important issue in economics and finance as it is important to know if a structural break has occurred and, if it has, to infer the date of the break (Karavias *et al.*, 2023). Several existing studies have focussed on the issue of identifying structural breaks in financial markets related data series (Abdennadher and Hallara, 2018; Karavias *et al.*, 2023; Samant and Singh, 2022; Narayan *et al.*, 2013; Zarei *et al.*, 2015; Zhao and Wen, 2022). Identification of structural breaks assumes significance as it then allows further period-specific analysis, in this case of the Indian mutual funds industry and also possibly of the financial markets where they are investing. Identification of plausible development/event that triggered a structural break can not only help in understanding the potential impact of such development/events but also provide insight into possible future trigger factors that may alter the trajectory of the Indian mutual fund industry going forward.

The remainder of the article is organised as follows: Section II presents a literature review of the drivers behind shifting investors' preference towards mutual funds. Section III provides a snapshot of the mutual fund industry at the global level juxtaposed with the growth of the Indian mutual fund industry, while section IV deep dives into the trend of the mutual fund industry using a combination of overall and category-wise data on AUM, inflows, and folios. Section V outlines potential sector-specific, domestic, and global developments which may have resulted in structural breaks and discusses the data and methodology being utilised to test for it. Section VI provides the results of the empirical tests followed by a discussion on its relation to developments outlined earlier. Section VII provides some concluding remarks and potential areas for further research.

## II. LITERATURE REVIEW

For households, mutual funds can act as an alternative to traditional sources of savings and investment, including physical assets like gold and real estate, which often suffer from a lack of efficient price discovery, low liquidity, and high transaction costs. Mutual funds, due to small investment units and professional fund management teams at the helm, can especially help households create a diversified and well-researched portfolio, especially in riskier asset categories such as equities, albeit at lower transaction cost than direct equity investment (Divakaran *et al.*, 2015; Engen and Lehnert, 2000; Mack, 1993; Reid, 1986; Sellon, 1992). Mutual funds also provide a much easier and more efficient mechanism for increasingly financially aware investors to obtain exposure to foreign stocks, in a bid to reduce country risk, benefit from stock price boom in foreign markets or even purchase undervalued global assets (Edwards, 1994; Reid, 1986).

Further, investors may often be attracted to mutual funds due to the lure of higher returns, especially during periods witnessing a rise in stock prices, relatively low and stable interest rates, and subdued inflation (Reid, 1986). Studies at the micro-level (fund level) have often argued that superior past performance of

funds and high public expectations of market returns often lead to higher inflows, especially from retail investors (Ferreira *et al.*, 2012; Ferson and Warther, 1996; Guercio and Tkac, 2002; Shu *et al.*, 2002). Households may prefer shifting to not just short-term money market funds and debt funds but also to equity and hybrid funds, especially in periods of falling bank interest rates on deposits. However, others have argued that mutual fund flows are not guided by past returns, especially at the macro-level (Engen and Lehnert, 2000; Remolona *et al.*, 1997; Warther, 1995). Further, any correlation seen between mutual fund flows and market returns may be driven by a common third factor, like investor sentiment (Edelen and Warner, 2001; Kopsch *et al.*, 2015; Remolona *et al.*, 1997).

Investor sentiment regarding financial markets' returns is influenced by a multitude of factors including sector-specific regulatory and policy changes, broader economic and policy changes, and even changes in the political environment. Literature has found that both US equity market returns and investors' allocations among different assets showcase the partisan impact of presidential election outcomes and expected outcomes (Bonaparte *et al.*, 2017; Santa-Clara and Valkano, 2003; Snowberg *et al.*, 2007). Further, these differential returns have been attributed to investors perception regarding the government, especially in terms of control of corruption, government effectiveness, bureaucratic control, and government/political stability (Asteriou and Sarantidis, 2016; Hussain *et al.*, 2017; Irshad, 2017; Lehkonen and Heimonen, 2015).

Changes in regulations or policies governing mutual funds and the asset classes they invest are also expected to impact mutual fund flows. Policies aimed towards facilitating the creation of new along with the expansion of existing mutual fund companies/Asset Management Companies (AMCs), distribution companies, and even distribution channels are also expected to support growth in mutual fund inflows (Reid, 1986). However, others have contested the direction of causality and rather argued that rise in investor preference towards mutual funds often attracts more AMCs and distribution partners. Other supportive policies including rationalisation of charges, reduction of entry/exit loads, risk labelling, creation of systematic investment plans, introduction of direct plans, reducing the minimum investment threshold can also spike investors' interest in mutual funds. Further, efforts aimed at increasing awareness of investors regarding mutual funds by regulators, industry bodies, distributors (banks, wealth management firms, fintechs), and even financial advisors can increase investor participation in mutual funds.

Further, even regulations and policies targeting other financial sectors can also impact mutual fund inflows. Existence of regulatory arbitrage vis-à-vis banks can provide a comparative advantage to mutual funds while attracting and retaining investors. Similarly, favourable tax policy or mandatory investment into mutual funds or pension funds (like NPS) can also act as a nudge factor for investors to invest in mutual funds (Reid, 1986; Sellon, 1992). For example, in India, Equity-Linked Savings Schemes (ELSS) are included as an investment option for claiming deductions from taxable income under income tax. Further, mutual funds in India are taxed via the long-term capital gains tax which is currently at 10 percent for equity and equity focussed hybrid funds and 20 percent for debt funds; while



interest income from bank deposits are taxed at income tax slabs which are more than 30 percent for the highest bracket<sup>2</sup>.

### III. GLOBAL SNAPSHOT OF THE MUTUAL FUND INDUSTRY

After the GFC, the AUM of the mutual fund industry increased from USD 25.6 trillion in 2008 to USD 74.0 trillion by 2023Q4. In 2008, USA accounted for nearly 45 percent of the global AUM, followed by Europe which accounted for nearly 38 percent, and Asia Pacific accounting for 10 percent. By 2023, while USA increased its share to nearly 50 percent, Europe saw its share shrinking to less than 30 percent. The Asia-Pacific region has also increased its share to more than 13 percent (Figure 4a).

Further, we find that in terms of global AUM, there doesn't seem to be a sharp uptick post 2014 as we could see in the case of India. On the contrary, the Cumulative Aggregate Growth Rate (CAGR) of global AUM has declined in the 2014-23 period to 6.2 percent from 7.4 percent seen in the 2008-14 phase. A similar decline was seen in the case of USA and Europe where the CAGR declined to 6.8 percent and 4.3 percent in the 2014-23 period from 8.0 percent and 6.2 percent in the 2008-14 period respectively. The only major region to witness a strong uptick was the Asia-Pacific region which saw its CAGR increase from 6.8 percent in the 2008-14 period to 9.7 percent in the 2014-23 period (Figure 4b). The strong growth of the industry may be attributed to the overall rapid growth of the financial industry in the region. Moreover, as highlighted by Marszk *et al.* (2019), the Asian and Pacific economies are attracting global interest, as these regions generate a large part of global economic growth.

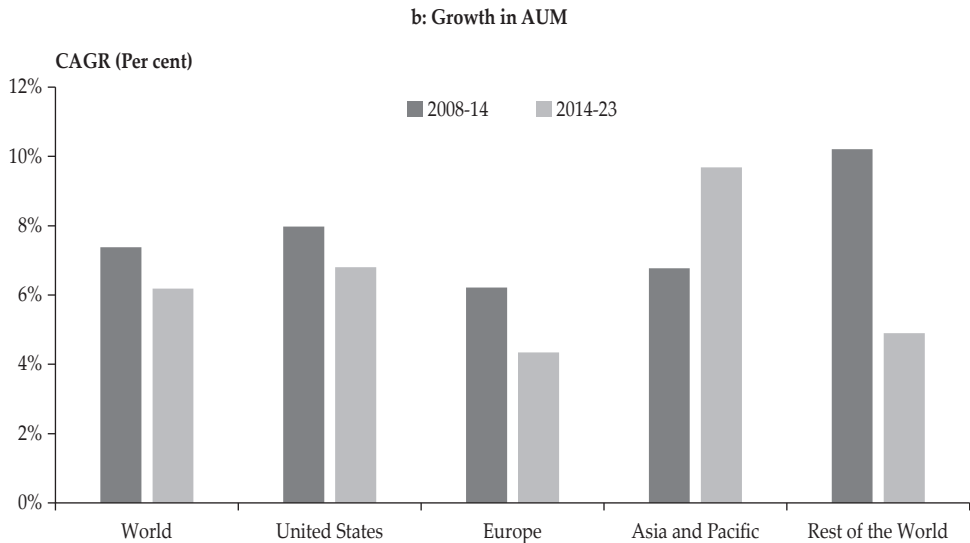
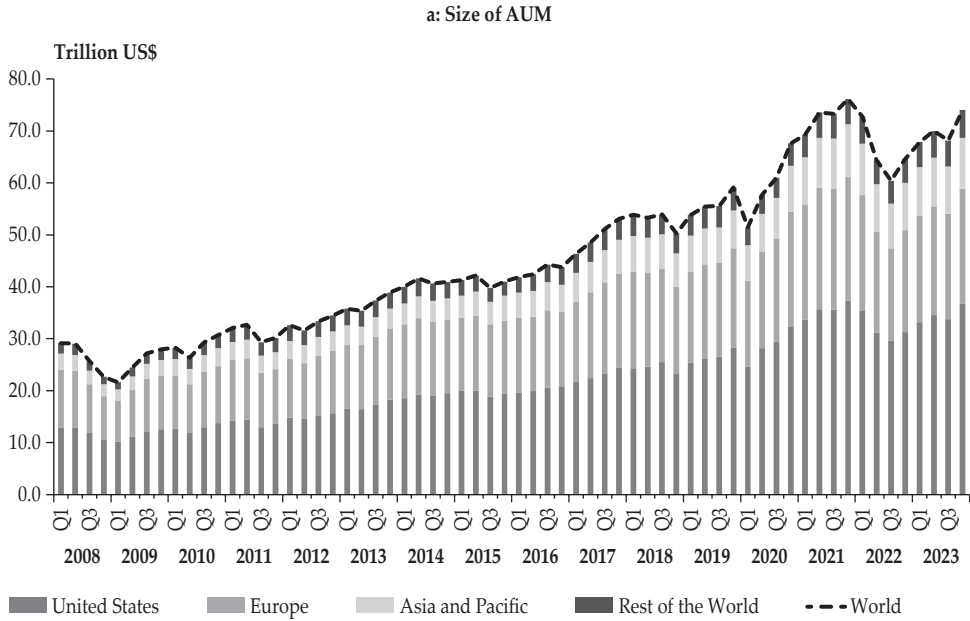
Juxtaposing India's mutual fund industry AUM with that of major economic regions globally, we find that the Indian mutual fund industry AUM trended broadly consistent with that in other major regions during the period 2008 to 2014. However, the Indian mutual fund industry AUM has grown much more rapidly since 2014 (Figure 5). As a result, India's share more than doubled from 0.3 percent to 0.8 percent in the global AUM during the period 2014-2023, and its rank in the overall size of the AUM improved to 16 in 2021 from 25 in 2013 (Appendix 1). This reflects that the growth in AUM of the Indian mutual fund industry since 2014 was not driven solely by global trends. Thus, a potential structural change in the dynamics driving the AUM of the Indian mutual fund industry needs to be explored.

Another point that merits consideration is the fact that the size of the Indian mutual fund industry is still quite low relative to that of several other economies, highlighting the scope of further expansion in the future.

<sup>2</sup> <https://www.amfiindia.com/investor-corner/knowledge-center/tax-corner.html>

**Figure 4.**  
**A Global Picture of the Mutual Fund Industry**

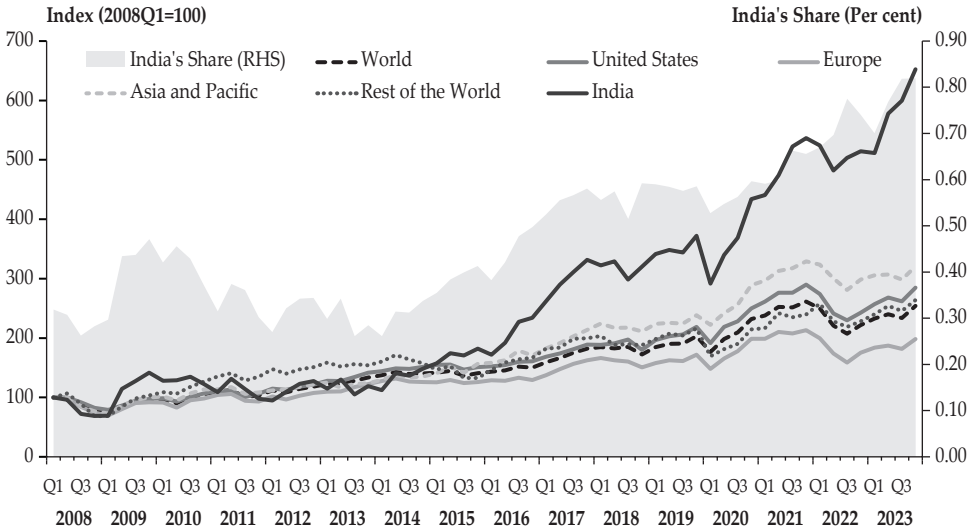
This figure in panel (a) shows the trend in AUM of mutual funds while panel (b) shows the growth rate in AUM for the major regions globally between 2008 and 2023.



Sources: Investment Company Institute (ICI) and Authors' calculations.

**Figure 5.**  
**Growth of MF Assets in India vs Major Regions/Group of Countries**

This figure shows the growth rate in AUM for India juxtaposed with major economies, regions, and global between 2008 to 2023 on the left axis. On the right axis, it shows the trend in the share of India’s mutual AUM in the global AUM between 2008 and 2023.



Sources: ICI and Authors’ calculations.

**IV. THE INDIAN MUTUAL FUND INDUSTRY**

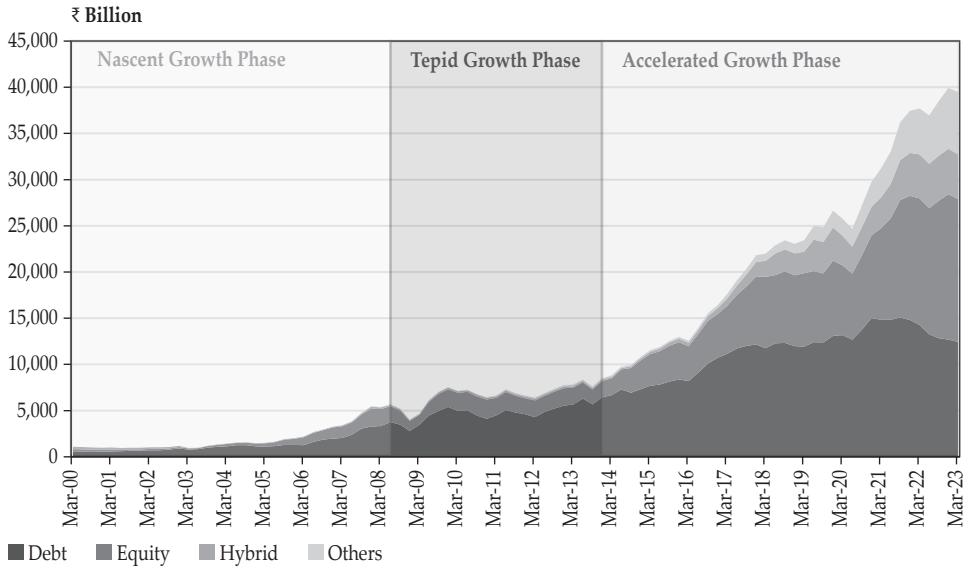
The AUM of the Indian mutual fund industry increased nearly 40 times from the start of 2000 to the end of 2023. However, based on growth performance, it may be broadly divided into 3 phases: (1) the nascent growth phase, the period from 2000 to the pre-GFC; (2) the tepid growth phase, the period from post-GFC to early 2014; and (3) the accelerated growth phase, the period from 2014 to until 2023 (Figure 6).

In the first phase, AUM grew at a robust CAGR of 25%, *albeit* from a very small base. Both debt and equity funds registered robust growth, with equity funds witnessing the sharpest growth (Figure 7). This resulted in their share of total AUM increasing from 15 percent in 2003-04 to 34 percent in 2007-08 (Figure 8).

After the crash of capital markets worldwide and the resulting confidence crisis among investors owing to the GFC in 2008, the Indian mutual fund industry slipped into a phase of tepid growth that lasted until early 2014. While debt funds also experienced a deceleration in growth rate, it was extremely stark in the case of equity funds. Equity funds, which had seen a CAGR above 30 percent in the previous phase, saw stagnation in their AUM.

**Figure 6.**  
**AUM Evolution: Category-wise**

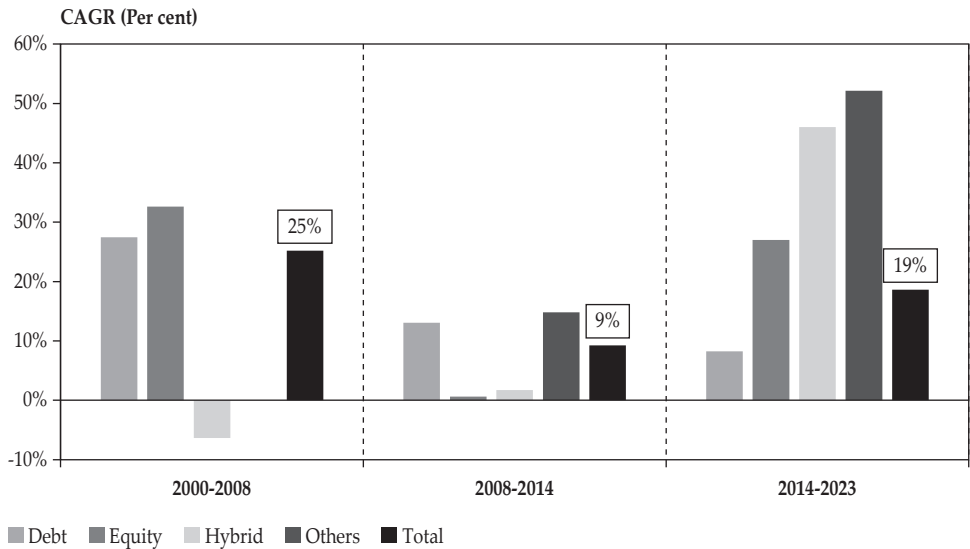
This figure shows the trend in category-wise AUM of Indian mutual funds from 2000:Q1 to 2023:Q1.



Sources: AMFI and Authors' Calculations.

**Figure 7.**  
**Category-wise CAGR of AUM across Phases**

This figure shows the cumulative aggregate growth rate in AUM of different categories of Indian mutual funds from 2000:Q1 to 2023:Q1 during three time periods (2000-2008, 2008-2014, 2014-2023).

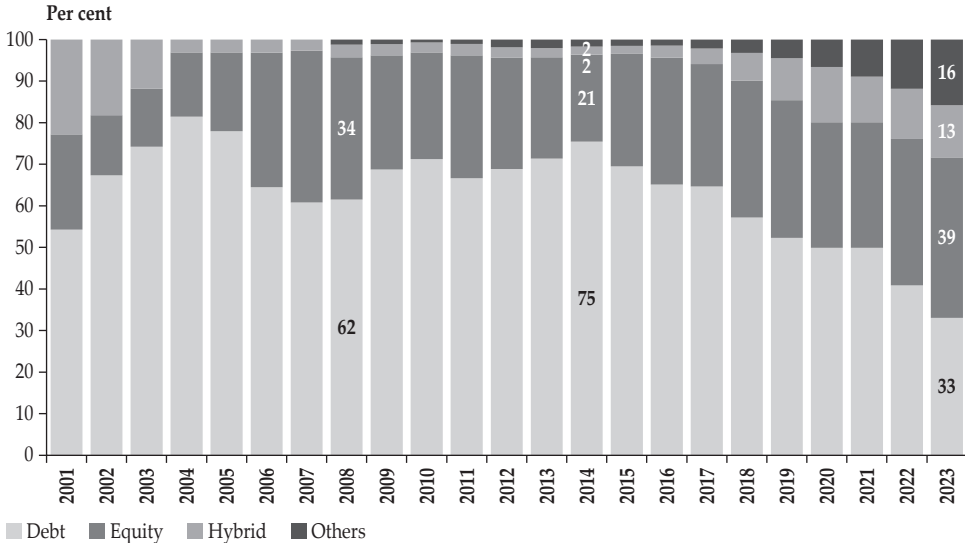


Sources: AMFI and Authors' Calculations.

However, the mutual fund industry witnessed a turnaround in Q2 of 2014, entering into a phase of accelerated growth. During this period, the growth in AUM was led by equity-oriented funds along with the hybrid category of funds<sup>3</sup>, which until 2014 accounted for only a minuscule portion of the total AUM of the mutual fund industry in India. The total AUM grew with a CAGR of 19 percent, while equity funds AUM registered a growth of nearly 30 percent from 2014 to 2023. Hybrid funds and ‘others’ (which mostly comprise equity-based ETFs) saw their AUMs grow with a CAGR of nearly 50%. As a result, the shares of equity, hybrid, and others have increased to 39 percent, 13 percent, and 16 percent, respectively, while that for debt funds in total AUM has shrunk to 33 percent.

**Figure 8.**  
**Broad Category-wise AUM Share**

This figure shows the composition of AUM of Indian mutual funds (average annually) from financial year FY01 to FY23.



Sources: AMFI and Authors' Calculation.

*A. Inflows into Mutual Funds*

Changes in AUM are a combination of valuation changes of the existing assets plus net inflows into the mutual funds. Thus, the AUM of the mutual fund industry may also increase due to a gain in the market valuation of underlying assets without a rise in inflows. On the other hand, inflow data are free from such a valuation effect and, therefore, an important metric for observing the rise or ebb in investors' preference toward mutual funds.

From the total sales/funds mobilised data aggregated at a quarterly level, it is observed that equity-oriented funds experienced a rapid rise in inflows in the period prior to the GFC but collapsed sharply and remained subdued for the

<sup>3</sup> Hybrid funds invest in a mix of equities and debt securities.

next six years. However, inflows have sharply risen since Q2 of 2014 and have continued to remain robust on average (Figure 9a).

Hybrid funds had negligible inflows until 2014; since then, they have also witnessed robust inflows. Inflows have grown from less than INR 20 billion a quarter before Q2 2014 to nearly INR 300-400 billion a quarter in the last few years, reflecting a growth of 10-15 times (Figure 9b).

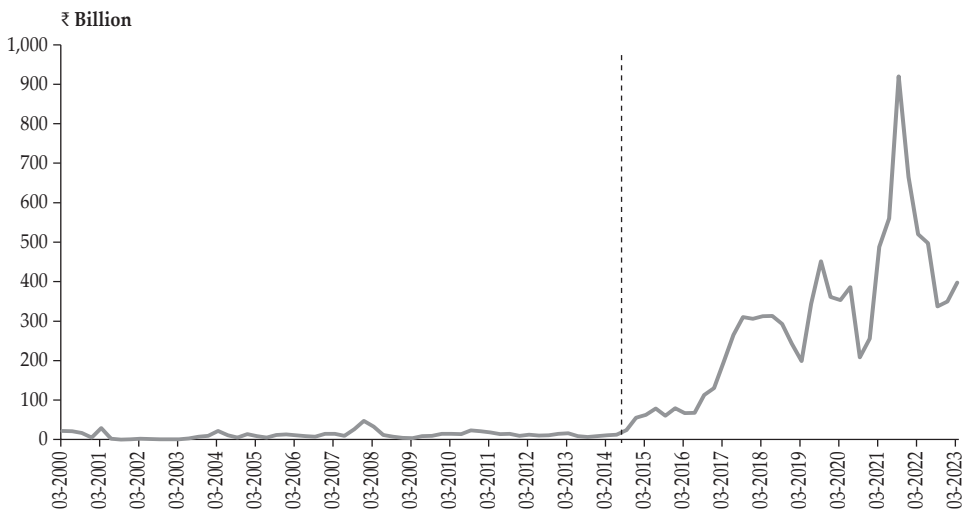
**Figure 9.**  
**Gross Sales/Funds Mobilised**

This figure shows the gross sales/inflows/funds mobilised by, (a) equity and (b) hybrid, category of Indian mutual funds from 2000:Q1 to 2023:Q1.

**a: Equity Mutual Funds**



**b: Hybrid Mutual Funds**

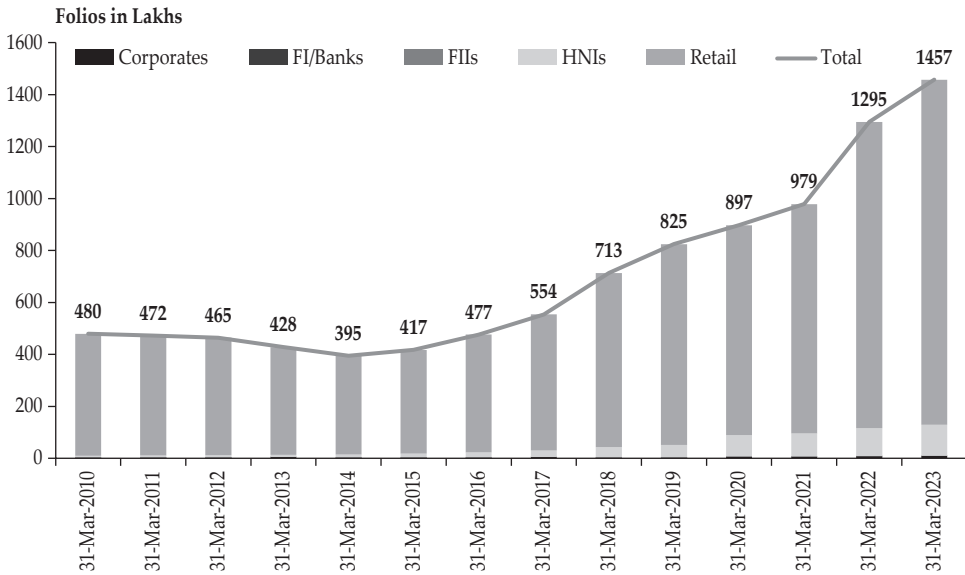


Sources: AMFI and Authors' Calculations.

Furthermore, this growth in mutual funds AUM and inflows has been driven by the rising participation of individual investors in mutual funds, which nearly stagnated after the global financial crisis until 2013 but has registered a significant rise since 2014, as seen from the consistent increase in the number of folios of individual investors (Figure 10). Furthermore, individual investors are invested in equity-oriented and hybrid funds, which can be gauged by the fact that individual investors accounted for nearly 90% of the total AUM in these categories as of the end of March 2021.

**Figure 10.**  
**Number of folios in MF**

This figure shows the trend in the number of folios by investor category from FY2010 to FY 2023.



Sources: AMFI and Authors' Calculations.

**V. DATA AND METHODOLOGY**

Sector-specific regulations allowing new products (gold ETFs, real estate mutual funds, etc.), facilitating foreign investors, and encouraging new AMCs (creation of UTI AMC) can act as potential structural breakpoints for the mutual fund industry. In addition, policies and regulations aimed at rationalisation of expenses (commissions, load structure, introduction of direct plans), creating new channels for investing in mutual funds, increasing payment options, better disclosure norms, and increasing investor awareness can also reinvigorate investors' interest and sentiment towards mutual funds. Major domestic events and policies including elections for central government, demonetisation, introduction of the Insolvency and Bankruptcy Code (IBC), and Goods and Services Tax (GST) can impact investor sentiment and perception towards financial markets. Policies like Pradhan Mantri Jan Dhan Yojana (PMJDY), Aadhaar (Targeted Delivery of Financial & Other Subsidies, Benefits & Services) Act, 2016, and Bharat Bond ETF

Launch can improve access to formal financial services and markets. Further, major global developments can directly impact investor sentiment and also indirectly through actions of FIIs impacting the financial markets. A list of such potential developments that can potentially alter the long-term perceptions and investment sentiment towards mutual funds as an investment option in India has been highlighted in Table 1.

If any of the events lead to a structural break, it has the potential implication that the impact of the event was not merely transitional but has impacted the long-term dynamics of the mutual funds landscape in India. Thus, in this section, an attempt has been made to empirically test for structural breaks in the AUM and inflows to equity and hybrid categories of the Indian Mutual Fund Industry using quarterly time series data from 1999Q4 to 2023Q1. While both the inflow and AUM data are available on a monthly basis, the data has been transformed to quarterly frequency for analysis. It has been done to reduce the impact of any large monthly fluctuations which otherwise may result in spurious breakpoints while also having the additional benefits of ignoring events with a very transitional short-term impact. In the case of AUM data, usage of average quarterly values also helps reduce the impact of valuation changes arising from volatility seen in daily asset prices.

**Table 1.**  
**Major Developments with Potential Impact on Mutual Fund Industry**

This table outlines the major sector-specific, domestic, and global developments that could have possibly impacted the investor perception and sentiment towards equity and the hybrid category of Indian mutual funds as an investment option.

| Description  | Date    |
|--|---------|
| <i>Sector Specific Developments</i>  |         |
| SEBI Investors Education Programme   | 2002-Q1 |
| Repeal of UTI Act  | 2003-Q1 |
| Introduction of Gold Exchange Traded Fund Schemes  | 2006-Q1 |
| Introduction of Real Estate Mutual Fund Schemes  | 2008-Q2 |
| Transparency in payment of commission and load structure   | 2009-Q2 |
| Facilitating transactions through Stock Exchange infrastructure  | 2009-Q4 |
| Introduction of applications supported by blocked amount (ASBA) as an additional mode of payment       | 2010-Q1 |
| Investment by Foreign Investors in Mutual Fund Schemes liberalised                                     | 2011-Q3 |
| Steps to re-energise Mutual Fund Industry  | 2012-Q3 |
| Facilitating transaction through Stock Exchanges – Allowing mutual fund distributors                   | 2013-Q4 |
| Facilitating transaction through Stock Exchanges – Allowing SEBI Registered Investment Advisors (RIAs) | 2016-Q4 |
| Instant Access Facility and allowing use of e-wallets  | 2017-Q2 |
| Categorization and Rationalization of Mutual Fund Schemes  | 2017-Q4 |
| Facilitating transaction through the Stock Exchanges – Directly for Investors                          | 2020-Q1 |



**Table 1.**  
**Major Developments with Potential Impact on Mutual Funds (Continued)**

| Description   | Date    |
|---|---------|
| <i>Domestic Developments</i>  |         |
| General Elections - 14th Lok Sabha  | 2004-Q2 |
| National Rural Employment Guarantee Act (NREGA)   | 2006-Q1 |
| General Elections - 15th Lok Sabha  | 2009-Q2 |
| General Elections - 16th Lok Sabha  | 2014-Q2 |
| Pradhan Mantri Jan Dhan Yojana (PMJDY)  | 2014-Q3 |
| Aadhaar (Targeted Delivery of Financial & Other Subsidies, Benefits & Services) Act, 2016 | 2016-Q1 |
| Insolvency and Bankruptcy Code (IBC)  | 2016-Q3 |
| Demonetization of High-Value Currency Notes   | 2016-Q4 |
| Implementation of Goods and Services Tax (GST)  | 2017-Q3 |
| Bharat Bond ETF Launch  | 2018-Q4 |
| General Elections - 17th Lok Sabha  | 2019-Q2 |
| <i>Global Developments</i>  |         |
| Oil Price Shocks  | 2000-Q1 |
| Dot-Com Bubble Burst  | 2001-Q4 |
| Global Financial Crisis   | 2008-Q3 |
| Quantitative Easing by Developed Economies  | 2009-Q1 |
| European Debt Crisis  | 2011-Q2 |
| Taper Tantrum   | 2013-Q2 |
| Brexit Vote   | 2016-Q2 |
| US-China Trade War  | 2018-Q2 |
| COVID-19 Pandemic   | 2020-Q1 |
| Russia-Ukraine War  | 2022-Q1 |

### A. Methodology

There are alternative models for identifying structural breakpoints. Chow (1960) tested for a single structural break at an a priori known date using an F-statistic. Quandt (1960) modified the Chow framework to allow for testing of a single unknown breakpoint. Andrews (1993) derived the limiting distribution of the Quandt test statistics by formulating the Quandt–Andrews test.

Advanced structural models allow for multiple breakpoints. Furthermore, these methods also do not require a priori information on the number of structural breakpoints and can endogenously determine the different structural break points. Bai (1997) proposed a simple approach for detecting more than one break by repeated application of a single breakpoint test.

Bai and Perron (1998) provide an alternative methodology. They considered a multiple linear regression model with  $m$  breaks. The breakpoints are explicitly treated as unknown.

$$y_t = x_t' \beta + z_t' \delta_j + u_t$$

- for  $j = 1, \dots, m+1$ , where  $m$  is the number of breaks,
  - $y_t$  is the dependent variable,  $x_t$  and  $z_t$  are vectors of covariates,  $\beta$  and  $\delta_j$  are the corresponding vectors of coefficients, and  $u_t$  is the disturbance term.
- For locating the breaks, two approaches are proposed:
- 1) In the global approach (**Model 1**), the break locations  $T_i$ ,  $i = 1, \dots, m$  are determined to minimise the sum of square residuals (SSR):

$$\sum_{i=1}^{m+1} \sum_{t=T_{i-1}+1}^{T_i} [y_t - x_t' \beta - z_t' \delta_j]^2$$

Let  $\hat{\beta}(\{T_j\})$  and  $\hat{\delta}(\{T_j\})$  denote the estimates based on the given  $m$ -partition  $(T_1, \dots, T_m)$ . Substituting these in the objective function and denoting the resulting sum of squared residuals as  $S_T(T_1, \dots, T_m)$ , the estimated breakpoints  $(\hat{T}_1, \dots, \hat{T}_m)$  are such that

$$(\hat{T}_1, \dots, \hat{T}_m) = \operatorname{argmin}_{(T_1, \dots, T_m)} S_T(T_1, \dots, T_m)$$

where the minimisation is performed over a set of admissible partitions. Thus, the breakpoint estimators are global minimisers of the objective function. Bai and Perron (2003) discussed a method based on a dynamic programming algorithm to find the most efficient global SSR-minimising breaks. The procedure of global minimisation has the advantage of ensuring that the most significant breaks are selected.

The main disadvantage is that the largest  $n$  breaks may not all be included among the largest  $n+1$  breaks. Therefore, the ratio of  $SSR_{t+1}/SSR_t$  does not asymptotically converge to the F-distribution. Bai and Perron, however, showed that it is possible to test the null of no structural break versus an unknown number of breakpoints up to some upper bound. These test statistics can be aggregated by various techniques, including by selecting the maximum value, i.e., the UDMax test statistic, or by using a weighting scheme, i.e., the WDMax test statistic.

The double maximum tests are very useful for determining structural changes because they can account for multiple structural changes that may be difficult to detect with a single break test change. Furthermore, the ability of double maximum tests to find unknown breakpoints is almost as good as that of tests with known breakpoints (Casini and Perron, 2019).

- 2) In the sequential approach (**Model 2**), breaks are determined sequentially, starting with a single break that minimises the SSR. For a model with  $L$  breakpoints, each of the  $L+1$  regimes is tested for an additional breakpoint using the  $\sup F(0,1)$  in each of the partitions. If the null of 0 breaks is rejected in at least one of the  $L+1$  partitions, then it establishes that  $L+1$  breaks are statistically significant. At each test step, the  $L$  breakpoints under the null are obtained by global minimisation of the sum-of-squared residuals.

Yao (1988) showed that the number of breaks that minimises the Schwarz criterion is a consistent estimator of the true number of breaks in a breaking mean model. Liu, Wu, and Zidek (1997) propose the use of the modified Schwarz criterion (LWZ) for determining the number of breaks in a regression framework (**Model 3**).

This study uses all three abovementioned models for identifying the structural break points of time series data of both AUM and inflows<sup>4</sup>. The advantage of using these models is multi-fold, (1) utilise the data to find the most appropriate number of breaks thus avoiding over or under fitting, (2) allow to find the most significant breakpoints thus avoiding selection bias (2) allow for identifying any other breakpoint which may not have been hypothesised thus avoiding omission error.

## VI. RESULTS

Structural break testing was first undertaken for AUM under the equity category and for an aggregate of equity and hybrid categories<sup>5</sup>. A similar exercise has been carried out for inflow data to determine whether the findings are consistent. The dependent variable is taken in log form to overcome the issue of scale, as both the inflows and AUM of the mutual fund industry have grown rapidly in magnitude, especially when comparing the latest period from 2014 onwards to the earlier pre-GFC period. The breakpoint estimation runs a regression with a regressor ( $Z_t = [t]$ ). The number of breaks allowed by the Bai-Perron model is five at most, with a trimming set at  $\epsilon = 0.15$ , which is used to adjust the estimates with a minimum of 15 observations within each segment.

In the case of the AUM of the equity category of mutual funds, all three models point toward 3 structural breaks and are also consistent with the choice of break points 2003Q3, 2008Q1, and 2014Q3 (Table 2).

<sup>4</sup> The past decade has seen the development of new structural tests of which Narayan and Popp (2010) two structural breaks unit root test (NP test) has been the most widely used. This may be attributed due to multiple reasons including, (1) It requires no prior knowledge for possible timings of the structural breaks, (2) It maximizes the significance of the break dummy coefficients, (3) It assumes similar critical values for both endogenous and exogenous variables in finite samples, and (4) Its superior size and power properties (Narayan and Popp, 2013; Rath and Akram, 2021). However, as our study considers the possibility of more than two structural breaks, we have not utilised the NP test, which in its traditional setup considers two unknown breakpoints.

<sup>5</sup> Equity and hybrid categories have been aggregated to overcome the issues of change in the classification of schemes following recategorisation exercise undertaken by SEBI of mutual fund schemes. The latest such reclassification was undertaken by SEBI in 2017, which is reflected in the change in categories of mutual funds schemes data released by AMFI since April 2019.

**Table 2.**  
**Structural Breaks in Equity AUM**

This table presents the result for the three structural break models for the equity category funds AUM taken in log form.

|                        | <b>Model 1</b>  | <b>Model 2</b>  | <b>Model 3</b>  |
|------------------------|---|---|---|
| Break Type             | Bai-Perron tests of 1 to M globally determined breaks                           | Bai-Perron tests of L+1 vs. L globally determined breaks                        | Compare information criteria for 0 to M globally determined |
| Selection              | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Schwarz criterion<br>Max breaks 5<br>Trimming 0.15          |
| Breaks                 | 2003Q3<br>2008Q1<br>2014Q3  | 2003Q3<br>2008Q1<br>2014Q3  | 2003Q3<br>2008Q1<br>2014Q3                                  |
| Dependent Variable     | Log of AUM Equity   |   |   |
| Sample                 | 1999Q4 2023Q1   |   |   |
| Number of Observations | 94  |   |   |

Similarly, for the aggregate (equity and hybrid) AUMs, 3 structural breakpoints were identified in 2003Q1, 2008Q2, and 2014Q3 (Table 3). The magnitude of the slope coefficient shows a major increase in the latest period for both equity and aggregate, confirming that the pace of increase in AUM in both cases has increased at a rapid pace since 2014 after the tepid growth that was observed in the previous phase from 2008 to 2014 (Appendix 2).

**Table 3.**  
**Structural Breaks in Equity + Hybrid AUM**

This table presents the result for the three structural break models for the aggregate (equity and hybrid) category funds AUM taken in log form.

|                        | <b>Model 1</b>  | <b>Model 2</b>  | <b>Model 3</b>  |
|------------------------|---|---|---|
| Break Type             | Bai-Perron tests of 1 to M globally determined breaks                           | Bai-Perron tests of L+1 vs. L globally determined breaks                        | Compare information criteria for 0 to M globally determined |
| Selection              | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Schwarz criterion<br>Max breaks 5<br>Trimming 0.15          |
| Breaks                 | 2003Q1<br>2008Q2<br>2014Q3  | 2003Q1<br>2008Q2<br>2014Q3  | 2003Q1<br>2008Q2<br>2014Q3                                  |
| Dependent Variable     | Log of AUM (Equity + Hybrid)  |   |   |
| Sample                 | 1999Q4 2023Q1   |   |   |
| Number of Observations | 94  |   |   |

Coming to the inflow data, it is observed that in the case of inflows into equity category schemes, three structural breaks are similarly observed in 2003, 2008, and 2014, as in the case of equity AUM (Table 4). Furthermore, the structural breaks in the case of inflows preceded those in the case of the AUM of equity schemes (2003Q1 vs 2003Q3 and 2014Q2 vs 2014Q3) whenever inflows increased and trailed when inflows were reduced. This further confirms that the changes in AUM are driven by changes in inflows. This in a way also points to the fact that investors in mutual funds are not solely driven by returns and rather account for major developments that may have long term implications for the financial markets.

**Table 4.**  
**Structural Breaks in Equity Inflows**

This table presents the result for the three structural break models for the equity category funds gross inflows taken in log form.

|                        | <b>Model 1</b>  | <b>Model 2</b>  | <b>Model 3</b>  |
|------------------------|---|---|---|
| Break Type             | Bai-Perron tests of 1 to M globally determined breaks                           | Bai-Perron tests of L+1 vs. L globally determined breaks                        | Compare information criteria for 0 to M globally determined |
| Selection              | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Schwarz criterion<br>Max breaks 5<br>Trimming 0.15          |
| Breaks                 | 2003Q1<br>2008Q2<br>2014Q2  | 2003Q1<br>2008Q2<br>2014Q2  | 2003Q1<br>2008Q2<br>2014Q2                                  |
| Dependent Variable     |   | Log of Inflow Equity  |   |
| Sample                 |   | 1999Q4 2023Q1   |   |
| Number of Observations |   | 94  |   |

Similar results are seen in the case of aggregate inflow (equity and hybrid) schemes, thereby reconfirming the findings of equity inflow structural break models (Table 5). The presence of structural breaks at similar time periods across all three models for all the variables at a high level of significance reflects the robustness of the estimates.

**Table 5.**  
**Structural Breaks in Equity + Hybrid Inflows**

This table presents the result for the three structural break models for the aggregate (equity and hybrid) category funds gross inflows taken in log form.

|                        | <b>Model 1</b>  | <b>Model 2</b>  | <b>Model 3</b>  |
|------------------------|---|---|---|
| Break Type             | Bai-Perron tests of 1 to M globally determined breaks                           | Bai-Perron tests of L+1 vs. L globally determined breaks                        | Compare information criteria for 0 to M globally determined |
| Selection              | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Highest significant<br>Max breaks 5<br>Trimming 0.15<br>Significance level 0.01 | Schwarz criterion<br>Max breaks 5<br>Trimming 0.15          |
| Breaks                 | 2003Q1<br>2008Q2<br>2014Q2  | 2003Q1<br>2008Q2<br>2014Q2  | 2003Q1<br>2008Q2<br>2014Q2                                  |
| Dependent Variable     | Log of Inflow (Equity + Hybrid)   |   |   |
| Sample                 | 1999Q4 2023Q1   |   |   |
| Number of Observations | 94  |   |   |

The structural break observed in 2003 can be attributed to a multitude of factors that are well documented in the literature, including the repeal of the UTI Act 1963 and the creation of the UTI Mutual Fund, as well as consolidations among private sector funds combined with the revival of investor confidence in equity markets after the dot-com bubble. The structural break in 2008 can be attributed to the GFC.

The most interesting is the structural break observed in 2014Q2. Regulatory measures taken by SEBI in the aftermath of GFC to revive mutual funds as an investment vehicle, especially those introduced in 2012 to re-energise the Indian mutual fund industry including rationalising expenses, moving to a single plan structure, mandating direct plans, enhancing disclosure norms, expanding distribution network would have potentially laid a fertile ground for future growth. The coincidence of the structural break with the general elections of 2014 points to the possibility of political conditions influencing investor sentiment in India and acting as a trigger point, as has been hypothesised and observed in other economies. There is also the possibility of a 'network effect' as rational investors may have forecasted improved investor sentiment leading to increased inflows into the mutual funds and thus increased investment in equity markets by these mutual funds. This in turn would lead to an increase in equity prices in the long run and thereby provide higher long-term returns, therefore attracting further investors. These rational investors would then have invested in the mutual funds to earn a potentially higher return. The presence of a structural break in 2014 thus reflects the forward-looking outlook of the retail investors, who based their investment decisions on future expectations about asset prices and the factors influencing them.

Absence of any subsequent break and the robust inflows being received since then can be attributed to a multitude of factors. Introduction of policies aimed at promoting a formal economy and actions against black money, including the Benami Transactions (Prohibition) Amendment Act (2016), the Demonetisation

of High Value Currency Notes in 2016, the introduction of the GST regime in 2017 and other policies such as the mandatory linking of PAN with Aadhar, necessitating the usage of PAN for high-value financial transactions, and moving towards the digitisation of property records were expected to bring relatively more transparency to transactions in physical assets such as gold and real estate, which were previously often considered safe haven assets for 'black money'. This may have contributed to a further shift in savers' preference toward more transparent and liquid assets such as mutual funds. Rapid digital transformations in the financial sector, including the rise of e-wallets and UPI, combined with the Aadhar Act, 2016 also provided an easy and cost-effective platform for accessing mutual funds.

Another interesting finding is the absence of structural breaks during the COVID-19 period. While COVID-19 was a major disruption, its impact on equity markets was short-lived in India. The market indices namely, NIFTY 50 and BSE SENSEX, had regained their previous levels in a matter of few months, underscoring the continued long-term positive outlook of domestic investors towards mutual funds and financial markets.

## VII. CONCLUSION

The Indian mutual fund industry has witnessed a nearly 40-fold increase in AUM since the start of the 21st century, although these two decades also include a period of extreme financial stress resulting from 2008-GFC. In the pre-GFC period, the nascent Indian mutual funds industry registered robust growth. In the aftermath of the GFC, the Indian mutual fund industry entered a phase of tepid growth. However, since 2014, the mutual fund industry has performed impressively, registering accelerated growth in AUM, primarily driven by robust and consistent inflows in equity and hybrid funds. The surge has been spearheaded by individual investors who have shifted towards mutual funds owing to a multitude of factors, including inherent structural benefits offered by mutual funds.

The empirical analysis, using advanced structural change models for both AUM and inflow data, also confirms that the mutual fund industry entered a stage of tepid growth in the aftermath of the GFC but has made a sharp turnaround, registering sharply accelerated and robust growth since 2014. In recent years, India's mutual fund growth has even outpaced advanced markets such as the U.S., Europe, and the BRICS, which has resulted in it becoming the 16<sup>th</sup> largest globally, from 24-25<sup>th</sup> place during the 2008-14 period.

Regulatory measures and initiatives by the SEBI and AMFI aimed at the reinvigoration of mutual fund industry in the post-GFC period possibly laid a fertile ground for the participation of individual investors. The coincidence of the structural break with general elections in 2014 warrants further research to explore the potential dynamics between political conditions and investor sentiments & preferences. Subsequently, the introduction of policies aimed at promoting a formal economy and actions against black money may have translated to a shift in savers' preference toward more transparent and liquid assets such as mutual funds.

The rapid expansion of the mutual fund industry has wider ramifications for the economy. The mutual funds industry acts as a financial intermediary by providing an alternative for savers, which are then efficiently channelised to producers in the form of providing equity capital and credit to corporations and funding government deficits. They can also act as counterweights against FPI outflows, especially during episodes of financial crisis, thereby promoting financial stability. However, there are concerns regarding the possible risks associated with financial stability, and there is a need to increase financial literacy and awareness among investors to facilitate more informed investment decisions.

Finally, although the Indian mutual fund industry has experienced impressive growth in recent years, it has an enormous scope for further expansion, as its penetration is still relatively low with the AUM-to-GDP ratio in India much lower compared to the global average. Further, favorable demographics, a healthy savings rate, rising financial literacy, growing use of fintech platforms, affordable internet availability, rollout of UPIs, increasing digitalisation, etc. are some of the factors which augur well for the mutual funds as an investment option in India. Our paper is potentially a starting point for further discussions and research into the dynamics and implications of the burgeoning mutual funds industry. By identifying and empirically verifying the presence of a highly significant structural break in 2014Q2, it allows further research to consider the post-2014 period as a separate period for analysis. Lastly, the presence of a structural break in 2008, highlights the long-term pessimistic impact a global crisis can have on the investor sentiment in emerging market economies like India. Thus, adverse global developments are a potential risk factor for the current optimistic investor sentiment for mutual funds in India.

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**Appendix 1:****The Top 20 Countries in Terms of the Size of the AUM (in billion US dollars)**

This table presents the 20 largest economies by the AUM size of the mutual fund industry as of 2023. It provides their rank in terms of AUM size and size of AUM in US\$ billions for 2008, 2013, 2014 and 2023.

| Countries      | 2023    |          | 2014    |          | 2013    |          | 2008    |          |
|----------------|---------|----------|---------|----------|---------|----------|---------|----------|
|                | Ranking | AUM Size | Ranking | AUM Size | Ranking | AUM Size | Ranking | AUM Size |
| United States  | 1       | 34547    | 1       | 19101    | 1       | 17148    | 1       | 12055    |
| Luxembourg     | 2       | 5627     | 2       | 3796     | 2       | 3382     | 2       | 2684     |
| Ireland        | 3       | 4205     | 4       | 2007     | 5       | 1738     | 6       | 1064     |
| China          | 4       | 3314     | 12      | 633      | 12      | 446      | 13      | 301      |
| Germany        | 5       | 2776     | 5       | 1973     | 4       | 1797     | 4       | 1435     |
| Australia      | 6       | 2489     | 6       | 1703     | 6       | 1640     | 5       | 1076     |
| France         | 7       | 2392     | 3       | 2073     | 3       | 2016     | 3       | 2058     |
| Brazil         | 8       | 2389     | 7       | 1610     | 7       | 1605     | 8       | 940      |
| Canada         | 9       | 2204     | 9       | 1334     | 9       | 1199     | 10      | 709      |
| Japan          | 10      | 2107     | 10      | 1198     | 10      | 1150     | 7       | 949      |
| United Kingdom | 11      | 1998     | 8       | 1482     | 8       | 1275     | 9       | 764      |
| Switzerland    | 12      | 754      | 13      | 447      | 13      | 408      | 16      | 185      |
| Netherlands    | 13      | 731      | 11      | 818      | 11      | 727      | 19      | 132      |
| Korea, Rep. of | 14      | 706      | 14      | 323      | 14      | 283      | 14      | 284      |
| Sweden         | 15      | 588      | 15      | 305      | 15      | 255      | 17      | 161      |
| India          | 16      | 544      | 23      | 125      | 23      | 109      | 23      | 78       |
| Spain          | 17      | 375      | 16      | 281      | 16      | 232      | 12      | 347      |
| Italy          | 18      | 263      | 17      | 251      | 17      | 207      | 11      | 375      |
| Austria        | 19      | 223      | 18      | 205      | 18      | 205      | 15      | 214      |
| South Africa   | 20      | 211      | 19      | 172      | 19      | 163      | 20      | 91       |

Source: ICI and authors' calculations.

### Appendix 2: Coefficients of Structural Break Models for AUMs

This table presents the results of the structural break model for AUM of Equity and AUM of Equity & Hybrid.

| Equity                                |             |            |             |       | Equity + Hybrid                                |             |            |             |       |
|---------------------------------------|-------------|------------|-------------|-------|--|-------------|------------|-------------|-------|
| Dependent Variable: Log of Equity AUM |             |            |             |       | Dependent Variable: Log of Equity + Hybrid AUM |             |            |             |       |
| Method: Least Squares with Breaks     |             |            |             |       | Method: Least Squares with Breaks              |             |            |             |       |
| Sample: 1999Q4 2023Q1                 |             |            |             |       | Sample: 1999Q4 2023Q1                          |             |            |             |       |
| Included observations: 94             |             |            |             |       | Included observations: 94                      |             |            |             |       |
| Breaks: 2003Q3, 2008Q1, 2014Q3        |             |            |             |       | Breaks: 2003Q1, 2008Q2, 2014Q3                 |             |            |             |       |
| Variable                              | Coefficient | Std. Error | t-Statistic | Prob. | Variable                                       | Coefficient | Std. Error | t-Statistic | Prob. |
| <i>1999Q4 - 2003Q2 -- 15 obs</i>      |             |            |             |       | <i>1999Q4 - 2002Q4 -- 13 obs</i>               |             |            |             |       |
| T                                     | -0.05       | 0.01       | -6.65       | 0     | T  | -0.05       | 0.01       | -5.66       | 0     |
| C                                     | 5.6         | 0.07       | 74.76       | 0     | C  | 6.31        | 0.08       | 82.58       | 0     |
| <i>2003Q3 - 2007Q4 -- 18 obs</i>      |             |            |             |       | <i>2003Q1 - 2008Q1 -- 21 obs</i>               |             |            |             |       |
| T                                     | 0.15        | 0.01       | 23.22       | 0     | T  | 0.13        | 0          | 28.55       | 0     |
| C                                     | 2.8         | 0.16       | 17.85       | 0     | C  | 3.19        | 0.11       | 27.56       | 0     |
| <i>2008Q1 - 2014Q2 -- 26 obs</i>      |             |            |             |       | <i>2008Q2 - 2014Q2 -- 25 obs</i>               |             |            |             |       |
| T                                     | 0.01        | 0          | 2.31        | 0.02  | T  | 0.01        | 0          | 2.65        | 0.01  |
| C                                     | 7.08        | 0.17       | 41.72       | 0     | C  | 7.1         | 0.17       | 41.46       | 0     |
| <i>2014Q3 - 2023Q1 -- 35 obs</i>      |             |            |             |       | <i>2014Q3 - 2023Q1 -- 35 obs</i>               |             |            |             |       |
| T                                     | 0.05        | 0          | 15.86       | 0     | T  | 0.06        | 0          | 20.81       | 0     |
| C                                     | 5.3         | 0.22       | 24.33       | 0     | C  | 4.7         | 0.2        | 22.88       | 0     |
| R-squared                             |             |            | 0.99        |       | R-squared                                      |             |            | 0.99        |       |
| Adjusted R-squared                    |             |            | 0.99        |       | Adjusted R-squared                             |             |            | 0.99        |       |
| F-statistic                           |             |            | 1229.1      |       | F-statistic                                    |             |            | 1204.26     |       |
| Prob(F-statistic)                     |             |            | 0           |       | Prob(F-statistic)                              |             |            | 0           |       |

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