Impact of Mutual Fund Classification on Investors, Funds and Stock Market

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Abstract

We study the impact of a regulatory intervention when SEBI introduced a new mutual fund classification system in India[1]. The regulation aimed at bringing uniformity in the definition of fund categories and improve comparability of funds across fund families. Following the new regulation, we find the flow-performance sensitivity has increased, indicating a reduction in investor search costs. We also find that the performance of funds has increased in response to increased flow-performance sensitivity. However, on the downside, the new law has resulted in predictable fund flow to individual stocks, increasing the predictability of stock returns, and deteriorating market quality.

Key words: Mutual funds, Mutual fund classification, India.

1. Introduction:

The 2008 financial crisis has brought a renewed interest in consumer protection in financial rule making around the world. In emerging markets, where customers are financially less sophisticated and where financial product competition is low, regulations play a vital role in protecting customers. There are broadly two methods which regulators employ to protect retail/unsophisticated consumers. First, they could completely restrict unsophisticated consumers from accessing complex financial products like swaps. Second, regulators could take steps to help customers make well-informed decisions. This includes conducting investor

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[1]SEBI or Securities and Exchange Board of India is a securities market regulator in India.

education camps, mandating greater disclosures by financial intermediaries, and simplifying products. The regulators have to walk on a tight rope balancing the costs of restricting investors from accessing complex financial products with the benefits of protecting them from being mis-sold wrong financial products.

We do a cost-benefit analysis of one such regulation. On 6th October 2017, Securities and Exchange Board of India (SEBI) issued a circular introducing a mutual fund classification system for the first time in India[2]. The goal of the new regulation was to bring uniformity in mutual fund categories across fund families. Before the regulation, each fund family could adopt a different definition for a fund category[3]. The new regulation aims to reduce such variation in the definition of fund categories across mutual fund families.

The intended consequence of the law is that it would help mutual fund investors to better compare the performance of funds belonging to the same category and make informed decisions. This, in turn, would nudge fund managers to exert greater effort to improve fund performance. However, the regulation also has two unintended consequences. First, funds with broad investment mandates before the regulation would have to follow a narrower investment mandate. This restricts them from exploiting some investment opportunities which they could have otherwise before the new law. Second, compliance with the new regulation may require funds to trade in and out of stocks from time to time. Such regulatory compliance induced trading could have a significant impact on stock returns and market quality (Edelen and Warner 2001). Finally, strict

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[2]SEBI Circular - SEBI/HO/IMD/DF3/CIR/P/2017/114

[3]For example, SBI Large Cap category fund (SBI Blue Chip) had an investment objective to invest "in a diversified basket of equity stocks of companies whose market capitalization is at least equal to or more than the least market capitalized stock of S&P BSE 100 Index". In contrast, Birla Sun Life (BSL) Top 100 fund had an objective to "provide medium to long term capital appreciation, by investing predominantly in a diversified portfolio of equity and equity-related securities of top 100 companies as measured by market capitalization". Moreover, SBI Large Cap category fund had defined its investment universe based on free-float market capitalization (S&P BSE 100 index constituents are selected based on free-float market capitalization and liquidity) while BSL Large Cap category fund defined its investment universe based on the full market capitalization of stocks. Furthermore, BSL Large Cap fund declares that it will "predominantly" invest in large market capitalization stocks without explicitly specifying by how much it can deviate from the mandate.

standardization of categories implies Asset Management Firms (AMCs) could no longer offer innovative fund models beneficial to the investors.

We first test how the new classification system has affected investor's decision making process. Mutual funds can attract higher fund flow with either their superior performance or by offering differentiated products. Kostovetsky and Warner (2019) show that differentiated products have significantly lower flow-performance sensitivity. However, the new categorization norms reduce the scope for differentiation of funds belonging to the same category. Therefore, we hypothesize that the new regulation would result in an increase in fund flow sensitivity to performance. We model flow performance sensitivity using a piecewise linear regression similar to Sirri and Tufano (1998). We find strong evidence for an increase in flow performance sensitivity at high fund performance levels and mixed evidence for an increase in fund flow performance sensitivity at low-performance levels. We, therefore, conclude that the new regulation has increased flow-performance sensitivity.

Next, we test the impact of the new law on fund performance. Wahal and Wang (2011) show that funds which face high competitive intensity reduce management fees and have lower alpha. The regulation has resulted in an increase in competitive intensity through higher flow-performance sensitivity and reduction in the differentiation of funds. Accordingly, we find that the performance of funds has increased post the new regulation. We attribute the majority of the increase in fund performance to increase in effort by fund managers.

We then do a cross sectional analysis to understand the differential impact of new law across funds. The new law puts a lower limit on investment constraints for each category. Funds with broad investment mandate would have to make greater changes to their portfolio and give up on some investment opportunities to comply with the new law. Therefore, we hypothesize that the new law has a disproportionately more negative impact on the performance of funds with broader investment mandate. However, He and Xiong (2013) develop a theoretical model for optimal incentive contracts for delegated investment

managers. Their model shows that funds managers with higher ability tend to face less stringent investment mandates. Therefore, one may argue that the performance of funds with broader investment mandate will not be adversely affected under the new regulation, given they have higher skilled managers. Our results show mixed evidence that the performance of funds with broad investment mandate is negatively impacted.

Finally, Market cap based mutual funds may have to buy (sell) stocks belonging (not belonging) to their primary market from time to time to comply with the new regulations[4]. We find that this regulatory compliance induced trading has a significant impact on stock prices and creates stock return predictability. We conclude that while the new regulation has benefited mutual fund investors, the portfolio constraints have negatively impacted stock market quality. Overall our research highlights certain costs of increased retail investor protection.

The rest of the paper is organized as follows. Section 2 briefly introduces relevant literature. Section 3 provides the context of mutual fund industry in India and briefly discuses the new regulation. Section 4 describes data and variable construction. Section 5 presents our empirical results. Section 6 concludes.

2. Literature Review

Our paper is broadly related to three strands of literature. First, our paper is related to differentiation in mutual funds. Hortacsu and Syverson (2004) show that S&P 500 index funds employ non portfolio based differentiation to charge higher fees. Li (2005) develops a model to show that funds hold different portfolios which yield distinct return and enable them to charge higher fees. Kostovetsky and Warner (2019) shows that product differentiation in mutual

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[4]We define the primary market of a fund as the group of firms in which the mutual fund is primarily tasked to invest. For example, Large market capitalization stocks form the primary market of large-cap funds, small market capitalization stocks form the primary market of small-cap funds, and so on. Also, while Large Cap funds can invest up to 20% of the fund assets in non-large market capitalization securities, they would have to adjust their portfolio if this component rises above 20%.

funds attenuates flow-performance sensitivity. The new regulation improves the comparability of funds belonging to the same category and thereby reduces the search costs of the investor. Sirri and Tufano (1998) shows that flow performance sensitivity is more pronounced among fund with low search costs. Therefore, we would expect the flow performance sensitivity to increase after the new regulation.

Second, our paper is related to the literature on investment constraints of mutual funds. Almazan et al. (2004) show that investment constraints on mutual fund managers are consistent with optimal contracting. They find that high and low constrained funds produce similar risk-adjusted returns. However, He and Xiong (2013) develop a theoretical model and show that fund managers with higher investment ability have less stringent investment constraints. Accordingly we would expect funds with broader investment mandates to perform better than funds with narrow investment mandates. Buti (2004) shows that when mutual fund markets are not perfectly competitive, regulation helps protect investors by restricting the discretion of fund managers.

Third, our paper is related to the price impact of mutual funds. Coval and Stafford (2007) find that mutual funds experiencing large flows, drive security prices away from their fundamental value. Basak and Pavlova (2013) show that institutional investors benchmarked against an index tilt their portfolio to the benchmark index stocks, increase comovement in asset prices, and increase equity price volatility. Cao, Han, and Wang (2017) show that institutional investment constraints can explain price momentum and post earnings-announcement drift. Frazzini and Lamont (2008) show that large mutual fund flows as a measure of high investor sentiment predicts low future returns. Lou (2012) also shows that flow-induced trading positively predicts next year stock and mutual fund returns and their subsequent reversal. Boguth and Simutin (2018) and Ayash, Bednarek, and Patel (2017) find that constraints on mutual funds by the Investment Company Act of 1940 drives "betting against beta" phenomenon.

Also, our study is broadly related to the literature on the classification of mutual funds. Kim, Shukla, and Tomas (2000) find that over one-third of

the funds in their study have severely mis-classified stated objectives vis-a-vis attribute based objectives. However, they do not find that funds are intentionally mis-classifying to earn relative high performance. Chen, Cohen, and Gurun (2019) find that mutual funds deliberately mis-classify their portfolio holdings and that this has a significant impact on investor flows.

In the next section, we introduce the Indian mutual fund industry and the new piece of regulation introduced by SEBI for classification of mutual funds.

3. Indian Mutual Fund Industry

The modern mutual fund industry started in India with the establishment of Unit Trust of India by the Government of India in 1963. It was the only available mutual fund until 1987 which marked the entry of public sector banks and insurance companies into the mutual fund industry. Following the liberalization of the Indian economy, the private sector was allowed to operate mutual funds from 1993. Currently, all aspects of mutual fund operations in India are regulated by the Securities Exchange Board of India through provisions of SEBI (Mutual Funds) Regulations 1996. The Indian mutual fund industry has seen roughly a four-fold increase in Assets under Management (AUM) over the last decade which currently stands at 24.5 trillion rupees (\$347 billion)[5]. Table 1 below provides a snapshot of the mutual fund industry in India as on 30th September 2019.

We focus on Open-Ended equity mutual funds (Table 2). ELSS or Equity Linked Savings Schemes have a special tax incentive in Indian law and therefore are partially governed by the Ministry of Finance. Ministry of Finance guidelines require an ELSS fund to invest 80% of its total assets in equity. Of all the ten equity fund categories, ELSS is the least affected fund category by the new law.

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[5] AMFI reports the total AUM of mutual fund industry as 6.3 trillion rupees on 30th September 2009 and 24.5 trillion rupees on 30th September 2019

Table 1: AUM of Indian mutual fund industry as on 30th September 2019 (in INR billions)

	Open Ended Fund		Closed Ended Fund		Total AUM
	No. of Funds	AUM	No. of Funds	AUM	
Debt Funds	314	10,156	824	1,481	11,654
Equity Funds	318	7,242	121	328	7,572
Hybrid Funds	129	3,496	-	-	3,496
Solution Oriented	30	170	-	-	170
Other Funds	141	1,616	-	-	1,616
Total	932	22,681	945	1,809	24,508

Table 2: AUM of Equity mutual funds as on 30th September 2019 (in INR billions)

Fund Categories	No.of Schemes	AUM
Multi Cap Fund	35	1,439
Large Cap Fund	30	1,443
Large & Mid Cap Fund	24	532
Mid Cap Fund	25	787
Small Cap Fund	21	462
Dividend Yield Fund	6	45
Value Fund/Contra Fund	18	556
Focused Fund	21	423
Sectoral/Thematic Funds	95	621
ELSS	43	935
Total	318	7,242

*3.1. Categorization and Rationalization of Mutual Fund Schemes*

"It is desirable that different schemes launched by a mutual fund are clearly distinct in terms of asset allocation, investment strategy etc. Further, there is a need to bring in uniformity in the characteristics of similar type of schemes launched by different Mutual Funds. This would ensure that an investor of Mutual Funds is able to evaluate the different options available, before taking an informed decision to invest in a scheme."

—SEBI (Circular - SEBI/HO/IMD/DF3/CIR/P/2017/114)

SEBI issued a circular on 6th October 2017, titled "Categorization and Rationalization of mutual fund schemes" introducing a new classification system

which divided the entire mutual fund universe into five broad categories (see table 1). These five broad categories were further divided into 36 sub-categories[6].

All funds are required to identify themselves with one of the 36 categories and communicate it to their investors by prominently displaying it in all the marketing material. Also, all fund families are required to offer only one fund per category, removing any duplication of funds. Apart from introducing these fund categories, the circular also provided investment guidelines for each category. For example, the regulation requires Large Cap funds to invest at least 80% of the total assets in equity and equity-related instruments of large-cap companies while Sectoral Funds need to invest at least 80% of the total assets in a particular sector[7]. While restrictions such as maximum leverage and maximum exposure a fund could have to anyone firm or business group did exist before this regulation, it is the first time that SEBI has given comprehensive guidelines defining fund categories and their acceptable investment universe.

Figure 1: Timeline of event
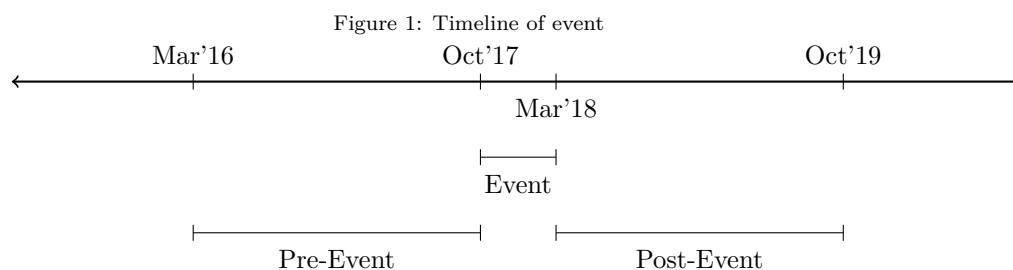
The new law on classification was issued in October 2017. The law required funds to submit a plan to comply with the SEBI guidelines within two months from the date of issuance of circular. Funds should make necessary changes to their portfolio, dissolve the fund, or merge with other funds, among other

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[6]For example, Equity funds are further divided into ten categories (see Table 2 for list of all equity fund categories). Similarly, Debt funds, Hybrid funds, Solution oriented Funds and Other Funds are further divided into 16, 6, 2 and 2 categories respectively. See Annexure of the SEBI circular (SEBI/HO/IMD/DF3/CIR/P/2017/114) for the full list of all categories

[7]See table 9 for acceptable investment universe of the ten equity fund categories. For full details of acceptable investment universe for all fund categories, see Annexure of circular, SEBI/HO/IMD/DF3/CIR/P/2017/114.

options to comply with the new law. The law gave another three months from the date of receiving an approval for the plan from SEBI to actually comply with the new law. Therefore we treat the five month window from October 2017 to February 2018 as event window. We treat the post-event window as from March 2018 to September 2019, the latest date for which we have all the data available. We treat a window of equal size from March 2016 to September 2017 as our pre-event window. Unless otherwise mentioned we do our analysis almost exclusively only on pre-event window and post-event window excluding event window.

4. Data

We get mutual fund data primarily from Lipper for Investment Management (LIM) database. This includes return data, portfolio holdings data, fund AUM data among others. We get AMFI fund category and AUM of fund family data from ACE mutual fund database[8]. We get all firm relevant data from Prowess-CMIE database including daily stock returns, industry classification, and market capitalization of the firms. Agarwalla, Jacob, and Varma (2013) provide us with Fama-French-Carhart risk factors and risk free rate for Indian markets. Indian debt markets are highly illiquid, a common feature among many emerging markets, making any analysis of Debt and Hybrid funds almost impossible. The new law is applicable only to open ended mutual funds. So we restrict our analysis to only open ended equity funds. About 86% of all equity fund investments are held by non-institutional investors (retail investors and high net worth individuals). Also equity mutual funds account for 80% and 42% of all mutual fund investments by retail investors and high net worth individuals respectively[9]. Therefore our sample is representative of all non-institutional investors.

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[8]Association of Mutual Funds in India or AMFI as the name suggest is an association of SEBI registered mutual funds in India and also a SEBI approved SRO

[9]Based on authors calculations as on September 2019. All data taken from AMFI (https://www.amfiindia.com/research-information)

Indian mutual funds typically offer three types of plans to investors - Dividend, Dividend reinvestment and Growth. In a dividend plan, funds periodically receive a pay out based on the policy of the fund[10]. In dividend reinvestment plan, the pay out is automatically reinvested into the fund. Finally, in a growth plan funds do not issue any dividends[11]. Also when an investor invests directly with the fund she will not be charged any marketing fee. This is called as direct option. On the other hand if the investor invests in the fund through a intermediary, it is referred to as standard option. All the three plans for any given fund have both standard and direct options. However all the six sub-class of funds (3 plans * 2 options) have the same underlying portfolio. Since our unit of analysis is a portfolio, we aggregate our data at fund level to avoid duplication. We also exclude all funds with AUM less than 50 million rupees (roughly 0.7 million USD[12]). Our final sample has 287 funds with 232 at the start of our pre-event window and 263 funds at the end of our post-event window.

We measure performance of fund in four different ways - simple raw returns, Jensen's alpha (CAPM), Fama-French (FF) three factor alpha, and Fama-French-Carhart(FFC) four factor alpha. We calculate alpha using rolling 36 months regression with at least 30 of the last 36 months data being non-missing. We aggregate these monthly alphas for higher level alphas. This effectively excludes young funds with less than 30 months of history from our analysis. Following Sirri and Tufano (1998) and Chevalier and Ellison (1997) we define flow for fund i in month t as follows:

$$Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + R_{i,t})}{TNA_{i,t-1}} \tag{1}$$

where $TNA_{i,t}$ represents Total Net Assets of fund i at the end of month t and $R_{i,t}$ is raw return of fund i in month t.

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[10]This dividend is not the same as dividend received by the fund from its portfolio holdings. Indian mutual funds issue dividends by liquidating their portfolio.

[11]Dividend reinvestment and growth plan are almost the same with differences only in taxation application on gains

[12]Assuming 1 USD = 70 INR

4.1. Variables

We analyze how restrictions by the new law effect mutual funds. Therefore we propose a new variable "Divergence" to measure the extent of impact of this new law on funds. We define Divergence as

$$Div_{i,t} = -min(Invest.\ in\ primary\ market_t - Minimum\ SEBI\ required\ invest.,\ 0) \tag{2}$$

Here "*Invest. in primary market*" refers to the percentage of total assets of the fund invested in securities in which the fund is primarily tasked to invest in. For example, Large Market Capitalization stocks would be classified as primary market for Large Cap funds. "*Minimum SEBI required invest.*" is the minimum investment required by any fund in its primary market. This number varies from one category to another category. For example, this is 80% for Large Cap funds while it is only 65% for Small Cap category companies. In any given month, if the investment by the fund in its primary market is more than the minimum investment required by SEBI, our Divergence variable equals zero other wise it equals the difference between minimum required and actual investment in primary market. The negative sign makes our divergence variable positive. We measure the magnitude of investment constraints by the new law, on any given fund, as the average value of divergence (*Div*) of that fund over a one year period[13]. Specifically, we define the investment constrain variable, *Avg. Div*, as

$$Avg.\ Div_i = \sum_{t=1}^{12} Div_{i,t}/12 \tag{3}$$

See Appendix 7 for definition of all the different equity categories.

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[13]We take average of *Div* over 12 month period instead of just the last month before the regulation to remove disproportionate impact of any given month. We try alternative specifications of *Avg. Div* variable such as taking average of *Div* over 6 months and 18 months. Our results qualitatively remain the same.

5. Results

We present the results in three parts - Impact on investors, Impact on funds, and Impact on security prices.

5.1. Impact on Investors

We first test how the new classification system affected investor search costs. Kostovetsky and Warner (2019) show that product differentiation in mutual funds reduces flow performance sensitivity. The new law reduces differentiation and improves comparability between funds belonging to the same category. Also, Sirri and Tufano (1998) show that flow performance sensitivity is higher for funds with low search costs. Therefore we hypothesize that flow performance sensitivity of funds increases post the new law.

We model flow performance sensitivity using a piece wise linear regression similar to Sirri and Tufano (1998). We allow slopes to differ for the lowest quintile, middle three quintiles and top quintile. Every month we rank funds within each category based on their last three months performance on a continuous scale from 0(worst) to 1(best). The coefficients of these piece wise decompositions of fractional ranks represent the marginal flow response to performance. We break the fractional performance rank of the funds into three variables as follows:

$$Low_{i,t} = min(0.2, Rank_{i,t})$$
$$Mid_{i,t} = min(0.6, Rank_{i,t} - Low_{i,t})$$
$$High_{i,t} = Rank_{i,t} - (Low_{i,t} + Mid_{i,t}) \tag{4}$$

We test if flow performance sensitivity increases after the introduction of new regulation by interacting these three performance variables with a dummy variable, $Post$, which equals 1 for the "post-event" period and 0 otherwise (we

exclude data from event window) in the following regression model:

$$Fund\ flow_{i,t} = \beta_0 + \beta_1 Low_{i,t-1} + \beta_2 Low_{i,t-1} \times Post_t + \beta_3 Mid_{i,t-1}$$
$$+ \beta_4 Mid_{i,t-1} \times Post_t + \beta_5 High_{i,t-1} + \beta_6 High_{i,t-1} \times Post_t$$
$$+ \beta_7 Controls + \epsilon_{i,t} \tag{5}$$

For robustness we use four different measures of performance - Jensen's alpha or CAPM alpha, Fama-French three factor alpha (FF alpha), and Fama-French-Carhart four factor alpha (FFC alpha) which includes Fama-French three factors and a momentum factor[14]. We use natural log of Fund size in million rupees, natural log of Fund age in years, and natural log of fund family size in million rupees as our control variables. We report the results in Table 3[15].

Columns 1-2 rank funds based on Raw returns, columns 3-4 rank funds based on CAPM alpha and columns 5-6 rank funds based on Fama-French-Carhart four factor alpha. In columns 1, 3, and 5 we simply regress our flow variable on the three performance variables Low, Mid, $High$ along with our control variables and fund and time fixed effects. Contrary to Sirri and Tufano (1998), we do not find coefficient of Low significant in India. When we interact the three performance variables with $Post$ dummy, we find there is an increase in flow-performance sensitivity at high performance levels (columns 2, 4 and 5 of Table 3). Also, for a 10 percentile increase in raw performance rank in the top performance quintile, the fund would receive an additional flow of 7.2% per year in the post investment period[16]. This is statistically as well as economically significant.

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[14]We do not report results of ranking the funds based on Fama-French three factor alpha due to space constraints in table 3. However, results remain qualitatively the same.

[15]We exclude ELSS funds from our sample for reasons clarified in the next section. However, our results do not qualitatively change with the inclusion of ELSS funds in our sample.

[16]We calculate this as 0.06(co-efficient of High $\times$ post) * 1% = 0.06% per month per percentile or 0.06% * 10 * 12 = 7.2% per year per 10 percentile increment in rank.

Table 3: Impact of new fund categorization law on flow-performance relationship

	Raw		CAPM		Fama-French-Carhart	
	(1)	(2)	(3)	(4)	(5)	(6)
High×Post		0.060^*		0.085^{**}		0.065^*
		(0.029)		(0.032)		(0.029)
Mid×Post		-0.009^*		-0.008		-0.010^*
		(0.005)		(0.005)		(0.004)
Low×Post		-0.019		-0.021		-0.015
		(0.017)		(0.019)		(0.020)
High	0.040^{***}	0.009	0.031^*	-0.012	0.021	-0.012
	(0.012)	(0.018)	(0.014)	(0.022)	(0.014)	(0.021)
Mid	0.008^{**}	0.013^{***}	0.008^*	0.012^{**}	0.008^{**}	0.013^{***}
	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)
Low	0.015	0.025^*	0.016	0.026	0.011	0.019
	(0.008)	(0.011)	(0.009)	(0.014)	(0.007)	(0.012)
Post		0.005		0.001		0.001
		(0.007)		(0.007)		(0.006)
Constant	0.032	0.027	-0.034	-0.030	-0.031	-0.031
	(0.072)	(0.071)	(0.083)	(0.081)	(0.083)	(0.082)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

Note: *p<0.05; **p<0.01; ***p<0.001

The table presents results of panel regression examining the effect of new fund categorization law on flow performance sensitivity. The dependent variable is *Fund Flow*. The independent variables include: three performance variables $Low_{i,t}$ defined as $Low_{i,t} = min(0.2, Rank_{i,t})$, $Mid_{i,t}$ defined as $Mid_{i,t} = min(0.6, Rank_{i,t} - Low_{i,t})$ and $High_{i,t}$ defined as $High_{i,t} = Rank_{i,t} - (Low_{i,t} + Mid_{i,t})$; *Post* dummy which equals 1 for the post event window and 0 otherwise. Controls include natural log of fund age, natural log of fund size and natural log of fund family size. For columns 1-2 we measure *Rank* as using fractional rank of the fund within the fund category using Raw Returns of the fund with 0 being worst performance and 1 being best performance. Similarly, columns 3-4 rank funds using CAPM alpha or Jensen's alpha, and columns 5-6 rank funds using Fama-French-Carhart four factor alpha. Robust t-statistics clustered by fund and time are reported in parentheses.

5.2. Robust check: Impact on Investors

Investments in ELSS category funds enjoy tax exemption under Section 80(c) of Indian Income tax Act. ELSS funds were required to invest at least 80% of their fund assets in equity even before the introduction of the new law by SEBI. Given that ELSS category funds are relatively unaffected by the new law we use them as control. We run a regression similar to the one as given in (5). Here, we interact the independent variables with our control variable, $Non-ELSS$, which

Table 4: Impact of new fund categorization law on flow-performance relationship: Robustness check

	Raw	CAPM	Fama-French-Carhart
High×Post×Non-ELSS	0.112*	0.115**	0.087**
	(0.044)	(0.040)	(0.033)
Mid×Post×Non-ELSS	−0.005	−0.014	−0.012
	(0.010)	(0.009)	(0.008)
Low×Post×Non-ELSS	−0.042	−0.030	−0.027
	(0.026)	(0.023)	(0.028)
High×Non-ELSS	−0.016	−0.004	0.008
	(0.029)	(0.025)	(0.021)
Mid×Non-ELSS	0.008	0.015*	0.013*
	(0.008)	(0.006)	(0.006)
Low×Non-ELSS	0.029	0.015	0.025
	(0.020)	(0.017)	(0.019)
Post×Non-ELSS	0.014**	0.010*	0.009
	(0.005)	(0.005)	(0.006)
Non-ELSS	0.037	−0.040	−0.039
	(0.043)	(0.038)	(0.039)
Constant	0.039	0.054	0.056
	(0.023)	(0.039)	(0.040)
Controls	Yes	Yes	Yes
Fund fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes

Note: *p<0.05; **p<0.01; ***p<0.001

The table presents results of a robust check for panel regression examining the effect of new fund categorization law on flow performance sensitivity. The dependent variable is $Fund\ Flow$. The independent variables include: three performance variables $Low_{i,t}$ defined as $Low_{i,t} = min(0.2, Rank_{i,t})$, $Mid_{i,t}$ defined as $Mid_{i,t} = min(0.6, Rank_{i,t} - Low_{i,t})$ and $High_{i,t}$ defined as $High_{i,t} = Rank_{i,t} - (Low_{i,t} + Mid_{i,t})$; $Post$ dummy which equals 1 for the post event window and 0 otherwise; $Non-ELSS$ dummy which equals 0 for ELSS category funds and 1 otherwise. We also include all the interaction terms between the three performance variables, and $Post$ and $Non-ELSS$ dummies. For brevity we only include terms containing $Non-ELSS$ dummy. Controls include natural log of fund age, natural log of fund size and natural log of fund family size. Robust t-statistics clustered by fund and time are reported in parentheses.

equals 0 for ELSS category funds and 1 otherwise. We report our results in Table 4. Our variables of interest in these regressions are $High \times Post \times Non-ELSS$, $Mid \times Post \times Non-ELSS$, and $Low \times Post \times Non-ELSS$. For brevity we exclude variables not containing our control dummy, $Non-ELSS$. Once again we find that coefficient of $High \times Post \times Non-ELSS$ is statistically and economically significant across specifications. For a 10 percentile increase in raw

performance rank of the fund in top performance quintile, the fund will receive about 14.2% of additional fund flow per year.

Therefore, we broadly conclude that there is an economically and statistically significant increase in flow-performance sensitivity post the new regulation. In the next section we study the impact of the new law on fund performance.

5.3. Impact on fund performance

We observed that flow-performance sensitivity has increased post the new regulation. Therefore, we would expect fund managers to exert greater effort and improve fund performance in the "Post-event" window. We test our hypothesis by estimating the following regression model:

$$Fund\ Perf_{i,t} = \beta_0 + \beta_1 Post_t + \beta_2 Fund\ Age_{i,t-1} + \beta_3 Fund\ Size_{i,t-1}$$

$$+ \beta_4 Fund\ Family\ Size_{i,t-1} + \beta_5 Controls + \epsilon_{i,t} \qquad (6)$$

We find the *Post* dummy positive and significant across specifications, indicating an increase in fund performance post the new regulation. There are broadly two ways in which fund managers can improve their performance, by exerting greater effort or by reducing fund management fees. If the increase in fund performance can be entirely attributed to reduction in fund fees, we would expect the *Post* dummy to be positive and significant for Net returns while being insignificant for Gross returns. We find the *Post* dummy to be positive and significant for both Gross returns and Net returns. Also our results are robust across specifications. Therefore, we can conclude that fund managers are exerting greater effort post the new regulation. We also find that coefficient of *Post* dummy for Net returns to be greater than that of Gross returns, indicating a reduction in fund management fees.

We conclude that, post the new regulation, as a response to increase in flow-performance sensitivity, funds improved their performance. They achieve this by fund managers simultaneously exerting greater effort and reducing management fees. Next we do a cross sectional analysis to understand if the new regulation

Table 5: Impact of investment constraints on fund performance

	Net Returns			Gross Returns		
	CAPM	FF	FFC	CAPM	FF	FFC
Post	1.198***	1.156***	1.305***	1.066***	1.094***	1.219***
	(0.010)	(0.007)	(0.008)	(0.011)	(0.008)	(0.009)
Fund Age	−0.134**	−0.141**	−0.066	−0.136**	−0.141**	−0.099
	(0.045)	(0.044)	(0.051)	(0.048)	(0.050)	(0.057)
Fund Size	−0.026***	−0.016***	−0.021***	−0.030***	−0.020***	−0.022***
	(0.005)	(0.004)	(0.006)	(0.005)	(0.004)	(0.006)
Fund Family Size	0.022**	0.018**	0.035***	0.009	0.012	0.037***
	(0.008)	(0.006)	(0.010)	(0.009)	(0.007)	(0.009)
Constant	0.400	0.322*	−0.272*	0.886***	0.742***	0.135
	(0.215)	(0.158)	(0.126)	(0.247)	(0.175)	(0.129)
Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes

The table presents results of panel regression examining the effect of new fund categorization law on fund performance. The dependent variable is Fund performance, $Fund\ Perf$. Both Net Returns and Gross Returns are used to a measure of fund performance. We measure fund performance as Jensen's alpha (CAPM), Fama-French three factor alpha (FF) and Fama French Carhart four factor alpha (FFC). The independent variables include: $Post$ dummy which equals 1 for the post event window and 0 otherwise, $Fund\ Age$ defines as natural log of fund age in years, $Fund\ Size$ defined as natural log of fund size in million rupees, and $Fund\ Family\ Size$ defined as natural log of fund family AUM in million rupees. We also include Category fixed effects (Category FE) and time fixed effects (Time FE) as control variables. Panel adjusted Newey and West (1987) standard errors with maximum lag length are reported in parentheses.
Note: *p<0.05; **p<0.01; ***p<0.001

has created some losers and some winners.

5.3.1. Impact on fund performance: Cross sectional analysis

The new law by SEBI puts a lower limit on constraints for each mutual fund category. Therefore, funds with broader investment mandate would have to revise their portfolio and may have to give up on some investment opportunities in future to comply with the new law. Therefore, we expect the new law will have greater negative impact on performance of funds with broad investment mandate than those funds with narrow investment mandate. However, He and Xiong (2013) develop a theoretical model for optimal incentive contracts for delegated investment managers and show that fund managers with higher ability have broader investment mandates. Therefore we hypothesize that, even though

the new law has more impact on funds with broader investment mandate, given that they are run by skilled fund managers they may not be impacted by it.

Table 6: Cross sectional analysis of impact of investment constraints on fund performance

	CAPM		FF		FFC	
	(1)	(2)	(3)	(4)	(5)	(6)
Avg. Div × Post	−0.009***		0.0004		−0.0003	
	(0.001)		(0.001)		(0.001)	
Avg. Div	0.006***		0.001		0.0003	
	(0.001)		(0.003)		(0.003)	
Avg. Div Dummy × Post		−0.151***		0.093**		0.051
		(0.048)		(0.042)		(0.051)
Avg. Div Dummy		0.167***		0.016		0.031
		(0.031)		(0.046)		(0.054)
Post	1.361***	1.348***	1.353***	1.333***	1.477***	1.463***
	(0.013)	(0.014)	(0.011)	(0.012)	(0.009)	(0.012)
Fund Age	−0.208***	−0.207***	−0.206***	−0.205***	−0.130***	−0.129***
	(0.045)	(0.046)	(0.042)	(0.043)	(0.043)	(0.044)
Fund Size	−0.014	−0.016*	−0.005	−0.005	−0.021**	−0.021**
	(0.011)	(0.009)	(0.008)	(0.007)	(0.011)	(0.009)
Fund Family Size	0.011	0.013	0.011	0.011	0.036***	0.037***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.014)	(0.013)
Constant	0.480**	0.468**	0.366**	0.372**	−0.246	−0.246
	(0.214)	(0.217)	(0.155)	(0.155)	(0.163)	(0.160)
Category fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

The table presents results of panel regression examining the effect of new fund categorization law on fund performance. The dependent variable is fund performance, $Fund\ Perf$. We measure fund performance as Jensen's alpha (CAPM), Fama French three factor alpha (FF) and Fama-French-Carhart four factor alpha (FFC). The independent variables include: $Avg.Div_i$ defined as $\sum_{t=1}^{12} Div_{i,t}/12$. Here time, t, varies over a 12 month period from March 2015 to February 2016. $Post$ dummy equals 1 for the "post-event" window else 0. $Avg.\ Div\ Dummy$ is a dummy variable that takes value 1 if the fund's $Avg.Div$ is in the top quintile else zero. Other independent variables included as control are $Fund\ Age$ defined as natural log of fund age in years, $Fund\ Size$ defined as natural log of a fund's total net assets in million rupees, and $Fund\ Family\ Size$ defined as natural log of fund family's total net assets in million rupees. Regressions numbered 1, 3, and 5 are run with "Avg. Div" as independent variable. In regressions numbered 2, 4, and 6 we use $Avg.\ Div\ Dummy$ as independent variable. We also control for Fund Category and Time fixed effects. Panel adjusted Newey and West (1987) standard errors with maximum lag length are reported in parentheses.
Note: *p<0.05; **p<0.01; ***p<0.001

We test the impact of the new law on fund performance by estimating the

following regression:

$$Fund\ Perf_{i,t} = \beta_0 + \beta_1 Avg.\ Div_i + \beta_2 Avg.\ Div_i \times Post_t + \beta_3 Fund\ Age_{i,t-1} +$$
$$\beta_4 Fund\ Size_{i,t-1} + \beta_5 Fund\ Family\ Size_{i,t-1} + \beta_6 Controls + \epsilon_{i,t}$$
$$(7)$$

Where, $Fund\ Perf$ represents fund performance. We measure fund performance as Jensen's alpha (CAPM), Fama French three factor alpha (FF) and Fama-French-Carhart four factor alpha (FFC). We measure the impact of the new law on a given fund using "Avg. Div" variable (See section 4.1 for description). We measure $Avg.\ Div$, by averaging Div variable over a 12 month period just prior to the event window, from October 2016 to September 2017. For robustness, we also use $Avg.\ Div\ Dummy$, a dummy variable that takes value 1 if the fund's $Avg.\ Div$ is in the top quintile else zero, as a measure of impact of new law on a given fund.

We report our results in table 6. Our results do not qualitatively change between $Avg.\ Div$ and $Avg.\ Div\ Dummy$. We do not find the coefficients of $Avg.\ Div$ to positive and significant across specifications. We also do not find the coefficient of interaction term between $Avg.\ Div$ and $Post$ dummy to be negative and significant. Therefore, we conclude that the new law does not have a statistically significant impact on fund performance.

5.4. Impact on stock market

We also study the impact of the new law on equity markets. We narrow our focus on four market capitalization based mutual fund categories - Large Cap funds, Large & Mid Cap funds, Mid Cap funds and Small Cap funds. We focus on them as the new law has a very specific investment mandate for each of these four category of funds (see table 9 for details). The new law defines top 100 companies by full market capitalization as Large Cap companies, the next 150 as Mid Cap companies, and the rest as Small Cap companies. The new law requires AMFI to classify stocks into these three market capitalization based

categories for every six months at the end of June and December. Also, together these four fund categories account for 45% of all equity mutual funds by AUM.

Table 7: Impact of new mutual fund classification law on stock prices

	CAPM	FF	FFC
	(1)	(2)	(3)
% Diff	−0.242***	−0.250***	−0.190***
	(0.045)	(0.045)	(0.047)
% Same	−0.180***	−0.154***	−0.164***
	(0.028)	(0.028)	(0.030)
Constant	−0.396***	0.696***	0.675***
	(0.113)	(0.113)	(0.119)
Sample Months	All	All	All
Observations	11,799	11,799	11,799
Adjusted R^2	0.007	0.006	0.004

The table presents results of a sub sample analysis of regression examining the impact of new fund categorization law on stock prices. The dependent variable is firm performance, $Firm\ Perf$ We measure firm performance as CAPM alpha, Fama-French(FF) three factor alpha and Fama-French-Carhart(FFC) four factor alpha represented above the column numbers. The independent variables include $\%Diff$ and $\%Same$. $\%Diff$ refers to percentage of firm held by all funds to which the firm does not constitute primary market. Similarly, $\%Same$ refers to percentage of firm held by all funds to which the firm is part of its primary market.
Note: *p<0.05; **p<0.01; ***p<0.001

We test the impact of mutual funds on stock prices by using the following regression:

$$Firm\ Perf_{i,t} \ = \ \beta_0 + \beta_1 \%Diff_{i,t} + \beta_2 \%Same_{i,t} + \epsilon_{i,t} \qquad (8)$$

Here the $Firm\ Perf$ refers to firm performance. For robustness we measure firm performance in three different ways, CAPM/Jensen's alpha, Fama-French three factor alpha, and Fama-French-Carhart four factor alpha. $\%Diff$ refers to percentage of firm held by all funds to which the firm does not constitute primary market. Similarly, $\%Same$ refers to percentage of firm held by all funds to which the firm is part of its primary market. For example, if 10% of the equity of a large market capitalization firm is held by Large Cap and Large & Mid Cap category funds and 5% by Mid Cap and Small Cap category funds

Table 8: Impact of new mutual fund classification law on stock prices (Sub-sample analysis)

	CAPM	FF	FFC	CAPM	FF	FFC
	(1)	(2)	(3)	(4)	(5)	(6)
% Diff	-0.323***	-0.340***	-0.271**	-0.169	-0.109	-0.052
	(0.095)	(0.096)	(0.099)	(0.100)	(0.100)	(0.110)
% Same	-0.202**	-0.180**	-0.199**	-0.177**	-0.031	-0.055
	(0.062)	(0.063)	(0.065)	(0.061)	(0.061)	(0.067)
Constant	-1.850***	-0.107	-0.126	-0.990***	0.108	0.158
	(0.252)	(0.255)	(0.263)	(0.251)	(0.251)	(0.276)
Sample Months		Jan & July			June & Dec	
Observations	2,249	2,249	2,249	1,693	1,693	1,693
Adjusted R^2	0.010	0.009	0.007	0.006	-0.0003	-0.001

The table presents results of a sub sample analysis of regression examining the impact of new fund categorization law on stock prices. The dependent variable is firm performance, $Firm\ Perf$ We measure firm performance as CAPM alpha, Fama-French(FF) three factor alpha and Fama-French-Carhart(FFC) four factor alpha represented above the column numbers. The independent variables include $\%Diff$ and $\%Same$. $\%Diff$ refers to percentage of firm held by all funds to which the firm does not constitute primary market. Similarly, $\%Same$ refers to percentage of firm held by all funds to which the firm is part of its primary market. Regressions numbered 1, 2, and 3 include data for months January and July and regressions numbered 4, 5, and 6 include data only for months June and December.
Note: *p<0.05; **p<0.01; ***p<0.001

then $\%Same = 10\%$ and $\%Diff = 5\%$.

We hypothesize that funds have a greater urge to sell a firm's equity for regulatory compliance when it does not belong to its primary market. This implies we expect β_1 to be less than β_2. We report our results in table 7. As hypothesized we find the coefficient of $\%Diff$ to be less than coefficient of $\%Same$. Next, if the above behaviour is driven by the new law we would expect β_1 and β_2 to be highest(lowest) in magnitude and significance in months January and July(June and December), just after(before) updating the firm market capitalization list by AMFI. Accordingly we do a sub-sample analysis and report our results in table 8. We find β_1 and β_2 higher in magnitude and statistical significance for the months of January and July. On the other hand we find β_1 and β_2 to be statistically insignificant for the months June and December. Therefore, we conclude the predictability in stock returns is driven by the new SEBI law.

6. Conclusion

Concerns about protection of retail investors has been at the fore front of discussions for various regulators around the world especially since the 2009 housing finance crisis. These concerns increase many folds in emerging markets like India where financial literacy and product market competition is typically lower. Anagol and Kim (2012), Anagol, Cole, and Sarkar (2017) and Sane and Halan (2017) find evidence for mis-selling of mutual funds, life insurance and tax-saving products respectively in India. In this context, SEBI introduced a new law to simplify mutual fund products, improve comparability and help customers make better decisions. We find the new law did help reduce the search cost for investors, improve flow-performance sensitivity, and improve performance of funds. On the other hand, market cap based mutual funds, by the nature of the new law are forced to trade in and out of stocks from time to time. This creates a price pressure on securities which could deviate them from their fundamental value.

7. Appendix

Table 9:   Equity fund categories and their characteristics

Fund Categories	Fund Characteristics	Divergence[1]
Multi Cap Fund	Minimum investment in equity & equity related instruments - 65% of total assets.	$-min\{Total\ Equity - 65, 0\}$
Large Cap Fund	Minimum investment in equity & equity related instruments of large cap companies - 80% of total assets.	$-min\{Large\ Cap - 80, 0\}$
Large & Mid Cap Fund	Minimum investment in equity & equity related instruments of large cap companies - 35% of total assets. Minimum investment in equity & equity related instruments of mid cap stocks - 35% of total assets.	$-min\{Large\ Cap + Mid\ Cap - 70, 0\}$
Mid Cap Fund	Minimum investment in equity & equity related instruments of mid cap companies - 65% of total assets.	$-min\{Mid\ Cap - 65, 0\}$
Small Cap Fund	Minimum investment in equity & equity related instruments of small cap companies - 65% of total assets.	$-min\{Small\ Cap - 65, 0\}$
Dividend Yield Fund	Fund should predominantly invest in dividend yielding stocks. Minimum investment in equity - 65% of total assets.	$-min\{Total\ Equity - 65, 0\}$
Value (Contra) Fund	Scheme should follow a value (contrarian) investment strategy. Minimum investment in equity & equity related instruments - 65% of total assets.	$-min\{Total\ Equity - 65, 0\}$
Focused Fund	A scheme focused on the number of stocks (maximum 30). Minimum investment in equity & equity related instruments - 65% of total assets.	$-min\{Total\ Equity - 65, 0\}$
Sectoral / Thematic Funds	Minimum investment in equity & equity related instruments of a particular sector/particular theme - 80% of total assets.	$-min\{Sectoral\ Equity - 80, 0\}$
ELSS	Minimum investment in equity & equity related instruments - 80% of total assets (in accordance with Equity linked Saving Scheme, 2005 notified by Ministry of Finance).	$-min\{Total\ Equity - 80, 0\}$

[1] Total Equity, Large Cap, Mid Cap, Small Cap, and Sectoral Equity refers to percentage of total assets of the fund invested in all equity, equity of large market capitalization firms, equity of middle market capitalization firms, equity of small market capitalization firms, and equity of firms belonging to corresponding sector of the fund respectively.

References

Agarwalla, Sobhesh K, Joshy Jacob, and Jayanth R Varma. 2013. "Four factor model in Indian equities market." Working Paper. IIMA Working Paper Series. Indian Institute of Management, Ahmedabad.

Almazan, Andres, Keith C. Brown, Murray Carlson, and David a. Chapman. 2004. "Why constrain your mutual fund manager?" *Journal of Financial Economics* 73 (2): 289–321. https://doi.org/10.1016/j.jfineco.2003.05.007.

Anagol, Santosh, Shawn Cole, and Shayak Sarkar. 2017. "Understanding the Advice of Commissions-Motivated Agents: Evidence from the Indian Life Insurance Market." *Review of Economics and Statistics* 99 (1): 1–15. https://doi.org/10.1162/REST_a_00625.

Anagol, Santosh, and Hugh Hoikwang Kim. 2012. "The Impact of Shrouded Fees: Evidence from a Natural Experiment in the Indian Mutual Funds Market." *American Economic Review* 102 (1): 576–93. https://doi.org/10.1257/aer.102.1.576.

Ayash, Brian, Ziemowit Bednarek, and Pratish Patel. 2017. "Asset Pricing Implications of Your Mutual Fund Manager's Constraints." San Luis Obispo, CA: Orfalea College of Business, CPSU. https://doi.org/10.2139/ssrn.2902965.

Basak, Suleyman, and Anna Pavlova. 2013. "Asset prices and institutional investors." *American Economic Review* 103 (5): 1728–58. https://doi.org/10.1257/aer.103.5.1728.

Boguth, Oliver, and Mikhail Simutin. 2018. "Leverage constraints and asset prices: Insights from mutual fund risk taking." *Journal of Financial Economics* 127 (2). Elsevier B.V.: 325–41. https://doi.org/10.1016/j.jfineco.2017.12.002.

Buti, Sabrina. 2004. "Asset Choice Regulation in Mutual Funds." Toulouse - GREMAQ. https://doi.org/10.2139/ssrn.567051.

Cao, Jie, Bing Han, and Qinghai Wang. 2017. "Institutional Investment Constraints and Stock Prices." *Journal of Financial and Quantitative Analysis* 52 (2): 465–89. https://doi.org/10.1017/S0022109017000102.

Chen, Huaizhi, Lauren Cohen, and Umit Gurun. 2019. "Don't Take Their

Word For It: The Misclassification of Bond Mutual Funds." Cambridge, MA: National Bureau of Economic Research. https://doi.org/10.3386/w26423.

Chevalier, Judith, and Glenn Ellison. 1997. "Risk Taking by Mutual Funds as a Response to Incentives." *Journal of Political Economy* 105 (6): 1167–1200. https://doi.org/10.1086/516389.

Coval, Joshua, and Erik Stafford. 2007. "Asset fire sales (and purchases) in equity markets." *Journal of Financial Economics* 86 (2): 479–512. https://doi.org/10.1016/j.jfineco.2006.09.007.

Edelen, Roger M., and Jerold B. Warner. 2001. "Aggregate price effects of institutional trading: a study of mutual fund flow and market returns." *Journal of Financial Economics* 59 (2): 195–220. https://doi.org/10.1016/S0304-405X(00)00085-4.

Frazzini, Andrea, and Owen A. Lamont. 2008. "Dumb money: Mutual fund flows and the cross-section of stock returns." *Journal of Financial Economics* 88 (2): 299–322. https://doi.org/10.1016/j.jfineco.2007.07.001.

He, Zhiguo, and Wei Xiong. 2013. "Delegated asset management, investment mandates, and capital immobility." *Journal of Financial Economics* 107 (2): 239–58. https://doi.org/10.1016/j.jfineco.2012.08.010.

Hortacsu, A., and C. Syverson. 2004. "Product Differentiation, Search Costs, and Competition in the Mutual Fund Industry: A Case Study of S&P 500 Index Funds." *The Quarterly Journal of Economics* 119 (2): 403–56. https://doi.org/10.1162/0033553041382184.

Kim, Moon, Ravi Shukla, and Michael Tomas. 2000. "Mutual fund objective misclassification." *Journal of Economics and Business* 52 (4): 309–23. https://doi.org/10.1016/S0148-6195(00)00022-9.

Kostovetsky, Leonard, and Jerold B. Warner. 2019. "Measuring Innovation and Product Differentiation: Evidence from Mutual Funds." *The Journal of Finance*, no. 0 (November): jofi.12853. https://doi.org/10.1111/jofi.12853.

Li, S. 2005. "Financial Product Differentiation and Fee Competition in the Mutual Fund Industry."

Lou, Dong. 2012. "A Flow-Based Explanation for Return Predictability."

Review of Financial Studies 25 (12): 3457–89. https://doi.org/10.1093/rfs/hhs103.

Sane, Renuka, and Monika Halan. 2017. "Misled and mis-sold: financial misbehaviour in retail banks?" *Journal of Comparative Economics* 45 (3). Elsevier Inc.: 429–44. https://doi.org/10.1016/j.jce.2017.06.001.

Sirri, Erik R., and Peter Tufano. 1998. "Costly Search and Mutual Fund Flows." *The Journal of Finance* 53 (5): 1589–1622. https://doi.org/10.1111/0022-1082.00066.

Wahal, Sunil, and Albert (Yan) Wang. 2011. "Competition among mutual funds." *Journal of Financial Economics* 99 (1). Elsevier: 40–59. https://doi.org/10.1016/j.jfineco.2010.08.012.