"Mutual fund flow-performance dynamics under different market conditions in South Africa"

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NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
86	0	4

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MUTUAL FUND FLOW-PERFORMANCE DYNAMICS UNDER DIFFERENT MARKET CONDITIONS IN SOUTH AFRICA

Abstract

Questions regarding the specific factors that drive continuous cash allocations by investors into portfolios of actively managed funds, despite consistent underperformance, continue to remain an inexhaustive aspect of the literature that calls for further investigations. This study assesses the dynamic relationship between fund flow and performance of equity mutual funds in South Africa under different market conditions. The study employs a GMM technique to analyze the panel data of 52 South African equity mutual funds from 2006 to 2019. The analysis found that convexity is prevalent in the flow-performance relationship, where fund contributors in subsequent periods allocate recent underperforming and outperforming funds disproportionate cash. This finding is evident in the lack of significance in the past performance effects on subsequent fund flows. The study found that lagged fund flows, fund size, fund risk, and market risk drive subsequent fund flows under changing conditions of the general market and fund markets. Overall, it is posited that fund contributors and asset administrators adapt to prevailing market dynamics relative to trading decisions. As a result, this affirms the normative guidelines of the Adaptive Markets Hypothesis, leading to the conclusion that exogenous factors drive fluctuations in fund flows in South Africa.

Keywords	fund flows, performance, market conditions, Adaptive Market Hypothesis, convexity, mutual funds
JEL Classification	G11, G14, G23

INTRODUCTION

The South African fund industry's trend statistics show that average returns earned across equity fund managers trailed the market by 34.01 percent in one year, trailed it by 84.66 percent in three years, and recorded a significant underperformance of 91.03 percent in five years (S&P, 2019). The evidence shows that within the five years under study (2014–2018), only 8.97 percent of active managers managed to beat the market, reflecting substantial inconsistencies in the pattern of performance by the few fund managers who succeeded in earning superior returns compared to the market (S&P, 2019). Nonetheless, the volume of new cash inflows into South African equity mutual funds increased, with over R1.9 trillion assets under management at the end of the third quarter of 2018 trading year (Rangongo, 2018).

Prior studies on the flow-performance relationship in South Africa are conducted in the context of stable market conditions, and hence cannot explain the enigmatic circumstances behind the increased fund flows against persistent underperformance by equity mutual funds in South Africa (Tan, 2015; Thobejane et al., 2017; Arendse et al., 2018). However, the Adaptive Market Hypothesis explanations suggest that the relationship between fund flow and performance will not hold under different market conditions, as individual markets experience

varying predictability levels attributable to market conditions (Urquhart & McGroarty, 2016). Scholars continue to question the rationality of mutual fund investors who persist in investing in actively managed funds, which cannot consistently outperform the benchmark (Berk & Green, 2004; Elton et al., 2011). This anomaly finds expression in behavioral debates that rely on unreasonable cognitive tendencies or a set of assumptions driven by agency issues or dispositional hazards (Baily et al., 2011).

In the above context, questions regarding the specific factors that drive the continuous cash allocations by investors into actively managed funds despite consistent underperformance remain a gap in the literature that calls for an investigation. In this context, this study aims to assess the dynamic relationship between fund flow and performance of equity mutual funds in South Africa under bull and bear market conditions.

1. LITERATURE REVIEW

1.1. Flow-performance dynamics under different market conditions

The flow-performance relationship is dynamic under varying conditions of the market, with the degree of responsiveness of cash flow to funds being more pronounced under bullish market conditions than under bearish markets (Gottesman et al., 2013; Jun et al., 2014). Also, investors generally exhibit a high degree of responsiveness to fund managers' recent outperformance compared to their reactions to underperformance (Rao et al., 2016). Furthermore, scholars have explained that the influence of contemporaneous performance is positively significant on cash flows after conditioning for endogeneity (Qian et al., 2014). However, evidence premised on fund contributors' reliance on past performance affirms a converse relationship between past performance and subsequent fund flows (Lou, 2012; Chen & Qin, 2014). A reverse interaction between flow and performance culminates in a situation where funds that benefit from increased cash flow levels can perform better than funds that secured limited cash flows in the past (Chen & Qin, 2014). This dynamic results from specific signaling indications embedded in past cash flows that are essential drivers of funds' future performance, notwithstanding its inadequacy to compensate for the cost involved in pursuing and utilizing such leading information (Lou, 2012; Nenninger & Rakowski, 2014).

Evidence has shown that factors that underpin periodic changeovers in market conditions and prices of financial securities are adequate predictors of investor cash allocation decisions on fund managers (Kurov, 2010). In an informationally efficient market where current security prices reflect relevant market information, the average fund investor would select a less risky investment during the bearish state of the need to optimize marginal utility (Sokolowsk & Makowiec, 2017; Lee et al., 2011). However, investors' risk-aversion tendencies under bear market conditions generally culminate in realizing low-value addition to underlying investment. A significant percentage of fund managers cannot exhibit the right market timing and stock-picking skill during declining periods of the market (Kacperczyk et al., 2014).

In the above context, changes in market conditions are more related to retail managers' cash flow than corporate managers, which indicates that differences in fund returns are often driven by irrational human tendencies of retail investors (Kim & Park, 2015; Ryu et al., 2017). Cognizant of the average investor's reactionary tendencies, the average fund manager is motivated to remain strategic in stock-picking under bull markets while exhibiting considerable caution in market timing under bearish market conditions to sustain fund flow (Huang et al., 2011). This behavior by fund managers is mainly associated with the view of the slow, sentimental response of equity investors to prevailing market trends under bullish market conditions compared to occasions of downturns in asset prices (Chalmers et al., 2013; Smales, 2017).

From the literature (Ippolito, 1992; Sirri & Tufano, 1998; Huang et al., 2007), issues that relate to marketing strategy and advertising, managerial skill, and strategy, investor search, investor participa-

tion fees, and investor cognitive dissonance or disposition effects are associated with convexity in the flow-performance relationship under different conditions of the market (as cited in Jun et al., 2014, p. 2). Based on the discussed dynamics in the flow-performance sensitivities, it is postulated that the degree of responsiveness in the relationship between fund flow and performance is more evident under bullish states of the market than under bearish conditions.

1.2. The South African mutual fund industry in context

The mutual fund industry in South Africa remains an integral aspect of the national economic system. Total estimated wealth of investable fund assets in excess of R2.4 trillion were held in over 1,590 portfolios as of the end of the third quarter of 2019 (ASISA, 2019). The recent report attributes the momentous leap in investor cash flows to fund managers in South Africa from the previous year's figure of R1.9 to windfall benefits accruing from a robust national financial system (Rangongo, 2018; Glow, 2020). Additionally, the analysts link this state of flow-performance relationship to international trade conflict among major economies (for example, the trade war between the United States and China) and recent economic obstacles faced by major Western markets that gradually diminished the returns of most multinational corporations (Glow, 2020).

The South African mutual fund (collective investment schemes) subsector of the national financial system is decomposed into three segments relative to the targeted clientele base, namely domestic, foreign, and world funds (ASISA, 2018). Primarily regulated by the financial services and conduct authority, mutual funds are enjoined by the mandatory requirement to trade the majority of financial resources mobilized from investors in the local economy (FSCA, 2013). Evidence (Tan, 2015) suggests a competitive fund stock market in South Africa post the global financial meltdown of 2007/2008, where less risk-bearing stocks manage to generate similar returns, identical to high-risk ones (Darrat et al., 2013). Trends in the fund market portray the prevalence of risk-shifting tendencies among active managers, indicative of less exposure during periods of decline in market re-

turns and aggressive investment activity during upper periods of the market (Popescu & Xu, 2017). Fund managers in South Africa exhibit traits of convex reactions relative to fluctuations in stock prices and the level of risk assumptions regarding access to market news on stocks of active portfolios (Arendse et al., 2018).

Like other emerging market equity markets, the South African fund industry generally exhibits persistence in performance while differing significantly in characteristics from equity funds of the US market (Huij & Post, 2011). However, recent evidence has shown that the South African equity fund industry is gradually filtering out of persistence in performance relative to their counterparts in other emerging markets (Bertolis & Hayes, 2014). Comparatively, the volumes of trade transactions in the US market significantly outweigh the SA market (ICI, 2018). The equity fund industry in South Africa bears a close resemblance to the US fund market structure as most South African mutual fund managers have a significant percentage of their investable assets committed to in-stock instruments, attributable to investors' attitudes toward excessive risk exposures associated with other investment strategies such as growth (Meyer-Pretorius & Wolmarans, 2006; Arendse et al., 2018). In respect of performance, the record of most equity funds has not reflected high investment skills. Tan (2015) reports that despite the South African financial system's resilience during the quantitative easing period after the global financial crisis in 2007/2008, most active managers showcased benchmark trailing performance relative to optimal stock selection and market timing expertise.

Analysts project a significant rise in South African mutual fund assets due to a resurgence in stock investment in 2019 and beyond (Ziphethe-Makola, 2017; Glow, 2020). In this context, knowledge of the influencing dynamics in the flow-performance relationship under changing market conditions become an essential toolkit for fund contributors and industry players for optimal investment decision-making. Given the above context, this study aims to assess the dynamic relationship between fund flow and performance of equity mutual funds in South Africa under different market conditions.

Given the above context, this study aims to assess the dynamic relationship between fund flow and performance of equity mutual funds in South Africa under different market conditions.

2. METHODOLOGY

2.1. Data and variable description

An unbalanced panel data for quarterly observations from 2006 to 2019 sourced from McGregor BFA Library, S&P Capital IQ, and the ASISA website is used to achieve the study's objective. A total of 52 actively equity mutual funds are included in the sample for analysis. For a fund to be included, it should have had a minimum of six years of data for analysis, and the sample is selected based on data availability. In calculating South African equity funds' performance, quarterly returns of the price index of funds are logarithmically computed. Following the literature, fund performance by raw returns is formulated as follows:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right) \cdot 100, \qquad (1)$$

where R_{it} is the return on fund i in quarter t, P_{it} denotes the current price of fund i in quarter at t, P_{it-1} is the price of fund in the previous period $t-1$, and $\ln$ is the natural logarithm of the price index (Brooks, 2014).

This study utilizes the Johannesburg Stock Exchange All Share Index (JSE ALSI) as a proxy for market performance during the preceding year for the sample period. Following Nenninger and Rakowski (2014), fund flow is computed as the net quarterly percentage of cash flows accruing to a fund resulting from investor stock purchasing and redemption activity. A fund flow is expressed as follows:

$$Flow_{it} = \frac{TNA_{it} - TNA_{it-1}(1 + r_{it})}{TNA_{it-1}}, \qquad (2)$$

where $Flow_{it}$ is the total net assets of fund i at quarter t, TNA_{it} reflects the fund's total net assets at quarter t, TNA_{it-1} is fund i total net assets for the previous quarter $t-1$, whereas r_{it} denotes fund i return in quarter t for which accounts for

reinvested dividends and adjusted for the fund's overheads.

2.2. Modeling fund flow-performance dynamics under different market conditions

According to Helwege and Liang (2004), it is expected that the average fund investor would continue to pick more stocks with funds under conditions where they are more confident about expected returns because prior states of the market influence investor decisions on mutual funds (as cited in Lee et al., 2011, p. 12). In this context, it is conjectured that the relationship between mutual fund flows and performance is dissimilar across different states of the equity market, where it is more pronounced under bullish markets than under bearish market conditions.

Following Akbar et al. (2016), the dynamic relationship between fund flow and performance of active managers under different market conditions is tested by applying the Generalized Method of Moments (GMM) technique. The advantage of applying the GMM technique is that past observations of the interest variables can influence the current value. Additionally, if there is unobserved unit-specific heterogeneity, disentanglement of the effects of the observed and the unobserved time-variant heterogeneity has proved to be problematic. As Arellano and Bond (1991) and Blundell and Bond (1998) stated, this approach becomes helpful as standard fixed and random effects estimators cannot be used due to multicollinearity problems, especially when the time dimension is limited (as cited in Kripfganz & Schwarz, 2015, pp. 1, 2). The adopted model is thus represented as follows:

$$
\begin{aligned}
Flow_{it} = {} & \alpha_1 + k_1 flow_{it-1} + \beta_1 Perf_{it-1} + \\
& + \beta_2 Mktcon_{[t-4,t-1]} + \beta_3 \ln(TNA_{it-1}) + \\
& + \beta_4 \ln(Age_{it-1}) + \beta_5 Std_{i,[t-4,t-1]} + \\
& + \beta_6 Std_{M,[t-4,t-1]} + \mu_i + \varepsilon_{it},
\end{aligned} \qquad (3)
$$

where $Flow_{it}$ the fund flow of fund i in quarter t, $flow_{it-1}$ is the lag flow of fund i in quarter $t-1$, $Perf_{it-1}$ is the lag performance of fund i in quarter $t-1$. The dummy variable $Mktcon$, which represents the market condition takes a value of 1

if the market return for the previous trading period is greater than zero, $R_{m,[t-4,t-1]} > 0$, indicating a bullish condition and takes a value of 0 if the market return for the previous period $[t-4,t-1]$ is less than or equal to zero, $R_{m,[t-4,t-1]} \leq 0$, indicating a bearish condition. Prior studies (Pettengill et al., 1995; Fletcher, 2000) relied on this formulation of market conditions (as cited in Jun et al., 2014, p. 23). In the analysis, a positive and significant coefficient of the market condition variable affirms the conjecture that flow-performance sensitivity is more pronounced under bullish market conditions than under bearish market conditions.

Chevalier and Ellison (1997) and Sirri and Tufano (1998) document large funds are generally more challenging to grow, and thus fund size $\ln\left(TNA_{it-1}\right)$ is included in the analysis to control for growth potential (as cited in Jun et al., 2014, p. 16). The natural logarithm of the fund age $\ln\left(Age_{it-1}\right)$, measured in the number of years, is included in the analysis to control the growth pace. Bergstresser and Poterba (2002) and Del Guercio and Tkac (2002) utilized fund age to control for the pace of fund growth, as the age of a fund affects fund contributors' preference since older funds generally grow at a slower pace than younger funds (as cited in Jun et a., 2014, p.16). The annualized standard deviation of the equity market's daily returns in the past year $Std_{M,[t-4,t-1]}$ in the analysis of the flow-performance relationship to control for the effect of market fluctuations, as stock market volatility (market risk) affects investors' decision on mutual funds (Barber et al., 2016). Lastly, the annualized standard deviation of fund monthly returns in the past year $Std_{i,[t-4,t-1]}$ is included in the regression to control for fund risk as investors are generally risk-averse, and the riskiness of a fund could adversely affect its expansion (Jun et al., 2014).

2.3. Flow-performance with changing conditions from the fund market

As a further test of the relationship between flow and performance under different market conditions, the analysis is extended to estimate the degree of responsiveness between future fund flow and lagged performance under different conditions of the fund market. In this context, the dynamic relationship between fund flow and performance of active managers under different conditions of cross-sectional performance of active managers is tested through the application of the Generalized Method of Moments (GMM) technique in the following equation:

$$
\begin{aligned}
Flow_{it} = {} & \alpha_1 + k_1 flow_{it-1} + \beta_1 Perf_{it-1} + \\
& + \beta_2 fndcon_{[t-4,t-1]} + \beta_3 \ln\left(TNA_{it-1}\right) + \\
& + \beta_4 \ln\left(Age_{it-1}\right) + \beta_5 Std_{i,[t-4,t-1]} + \\
& + \beta_6 Std_{M,[t-4,t-1]} + \mu_i + \varepsilon_{it},
\end{aligned}
\tag{4}
$$

where $Flow_{it}$ is the fund flow of fund i in quarter t, $flow_{it-1}$ is the lagged fund flow of fund i in quarter $t-1$, $Perf_{it-1}$ is the lagged performance of fund i in quarter $t-1$. The dummy variable *fndcon* takes a value of 1 if fund i's return for the previous trading period is greater than zero, $R_{i,[t-4,t-1]} > 0$, indicating a high performance condition and takes a value of 0 if fund i return for the previous period $[t-4,t-1]$ is less than or equal to zero, $R_{i,[t-4,t-1]} \leq 0$, indicating a lower performance condition. Similar to the assumption in equation (3), a positive and significant coefficient of the *fndcon* variable will mean that investor cash allocations in active portfolios significantly increase during periods of high fund market returns compared to periods of low fund market returns. Control variables for the analysis are the same as described under equation (3).

3. RESULTS AND DISCUSSION

3.1. Descriptive statistics

Table 1 shows the descriptive statistics of fund flows as a measure of investor cash allocations in fund portfolios and fund performance, which is the main independent variable of interest and control variables. It is observed from the table that there is more variation in contemporaneous and lagged flow percentages as revealed by their high standard deviations of 378.879 and 407.288, respectively, relative to their means of 21.868 and 31.080. The descriptive statistics also show high variation in cross-sectional performance of funds, as shown by the high standard deviation (1.483) relative to its mean (0.388). On average, most funds in the cross-section exhibit low variation in the dispersion of portfolio returns as indicated by

Table 1. Descriptive statistics

	FLOW	**PERF**	**LNTNA**	**LNAGE**	**STDMKT**	**STDFND**
Mean	21.850	1.322	5.834	2.548	0.932	0.008
Maximum	12769.82	17.768	10.581	3.871	2.099	0.027
Minimum	−102.196	−15.618	−1.231	0.000	0.499	−0.006
Standard deviation	378.879	1.493	0.442	0.667	0.135	0.003
Observations	1,221	1,221	1,221	1,221	1,221	1,221

the comparatively low standard deviation (0.003) relative to its mean of 0.008. A detailed observation of the table also shows less variation in the market returns, as shown by a low standard deviation of 0.135 relative to its mean (0.649). Most funds in the cross-section, on average, exhibit low variation in the dispersion of portfolio returns as indicated by the comparatively low standard deviation (0.003) relative to its mean of 0.008.

3.2. Correlation analysis

According to Dormann et al. (2013), a correlation of 0.7 and beyond among independent variables suggests the existence of a multicollinearity problem. From Table 2, the highest correlation is 0.62, which is between STDFND (the annualized standard deviation of a fund's monthly return in the past year) and STDMKT (annualized standard deviation of daily equity market return in the past year). The rest of the values are lower than 0.7, eliminating the possibility of the prevalence of multicollinearity issues among the set of independent variables employed in the analysis.

3.3. Flow-performance dynamics under different market conditions

Table 3 reports the GMM estimation of the dynamic relationship between fund flow and per-

formance under different stock market conditions. AR (2) is a test for second-order serial correlation in the first-differenced residuals, under the null of no serial correlation using the Arellano-Bond serial correlation test. AR (2) results imply the existence of no autocorrelation; hence, affirm the validity of the estimation model. Hansen test of over-identification is under the null that all instruments are valid. The diff-in Hansen test is under the null that instruments used for the equations in levels are exogenous. The outcome of this test suggests that the instruments used are exogenous and valid. *, **, *** denote 0.1, 0.05, and 0.01 levels of significance, respectively.

Focusing first on estimations generated through the GMM technique, the results depict no significant sensitivity in the relationship between fund flow and lagged performance under changing market conditions. This result contradicts the explanations in the literature that past performance significantly influences subsequent flows as found by Lou (2012), which is reinforced by Arendse et al. (2018). This evidence supports the reasons posited under the Adaptive Markets Hypothesis that financial markets adapt to changing conditions (Lo, 2012; Obalade & Muzindutsi, 2018). Further, investor stock-picking decisions relative to the prior performance of mutual funds vary under different market conditions, where it is more pronounced under bullish market conditions than under bear-

Table 2. Correlation matrix

	FLOW	**PERF**	**LNTNA**	**LNAGE**	**STDMKT**	**STDFND**
FLOW	1.000					
PERF	0.013	1.000				
LNTNA	0.033*	0.081***	1.000			
LNAGE	0.007*	−0.026***	0.027***	1.000		
STDMKT	0.009	−0.252***	−0.013	−0.044***	1.000	
STDFND	0.034	−0.195***	0.016	−0.078***	0.616***	1.000

Note: *, **, and *** indicate significance levels of 0.10, 0.05, and 0.01, respectively.

ish market conditions (Gottesman et al., 2013; Jun et al., 2014). Besides, the lack of significance in results obtained for the effect of past performance on fund flow suggests a prevalence of convexity in the flow-performance interaction, as documented by Leung and Kwong (2018). This finding implies that factors other than fund managers' prior performance drive the direction of flow-performance dynamics under different market conditions.

From Table 3, lagged fund flow reports a negative and significant coefficient. This finding suggests that funds with a recent history of enhanced fund flows generally experience a substantial reduction in fund flows in subsequent trading periods under changing market conditions. Prior studies (Kurov, 2010; Yao et al., 2014) suggest that fund contributors tend to be skeptical about the trading skills of active managers vis-à-vis performance under conditions of uncertainty in the market, and as a result, minimize the level of cash allocations to active portfolios while exhibiting herding behaviors under declining market conditions. Beyond the dynamics of lagged fund flow effect on subsequent flows, it can be observed from the table that lagged fund size reports a positive and significant coefficient. This result suggests that fund contributors are more comfortable allocating additional cash to fund managers who have a large asset base than managers with minimal asset bases under uncertainty conditions in the market. This finding is consistent with the position of extant literature.

Reuter and Zitzewitz (2010) show that the size of a fund influences investor cash allocation decisions on mutual funds, as investor confidence is bolstered in large funds' capacity to withstand dynamic market fluctuations. It reports a negative and insignificant coefficient regarding fund age, as can be observed from the table. This result implies that under changing market conditions, a fund's age does not influence the investor cash allocation to fund managers. This evidence contrasts the position of the literature. Del Guercio and Tkac (2002) document that fund age affects investor preferences, as older funds grow slower than younger funds (as cited in Jun et al., 2014, p. 16).

From the table, lagged annualized standard deviations of daily market returns (proxy for market risk) report a negative and significant coefficient.

This result suggests that fund contributors are sensitive to market returns dispersions, where an increase in market volatility adversely impacts fund flow. This finding is consistent with the findings of Barber et al. (2016), according to which increased market volatilities affect investor stock-picking decisions on mutual funds. In terms of fund risk, it can be observed from Table 3 that the annualized standard deviation of monthly fund returns reports a positive but insignificant coefficient. This result suggests that fund contributors are less sensitive to fund risk when making investment decisions under changing market conditions. However, according to Ben-David et al. (2019), fund contributors generally put a premium on fund risk when making stock-picking decisions on mutual funds. In this context, the current finding stands contrary to the position of extant literature. Given that the analysis is conducted under changing market conditions, this result finds expression in the adaption explanations posited under the AHM. A positive and significant coefficient is reported for lagged market conditions from the table. This result affirms the prior assumption of this study that the responsive relationship between contemporaneous fund flows and lagged performance is more pronounced under bullish conditions of the market than under bearish conditions, as documented by prior studies (Xiao, 2012; Gottesman et al., 2013).

Having discussed the difference in GMM estimation results, these are subsequently compared to results obtained through a two-stage system GMM approach. The two-stage process is more robust from the literature than the difference GMM estimator that simultaneously obtains all parameter estimates. A significant advantage of the two-stage system is that misspecified assumptions on the time-invariant regressors do not influence the estimation results for the time-varying variables' coefficients. According to scholars (Arellano & Bond, 1991; Blundell & Bond, 1998; Roodman, 2009), it allows for exploiting the advantages of estimators relying on transformations to eliminate the unit-specific heterogeneity (as cited in Kripfganz & Schwarz, 2015, pp. 1, 2).

From Table 3, lagged flow shows a highly significant coefficient via the two-stage approach, which is similar to the level of significance obtained by the difference GMM approach. However, it is pos-

itive in this instance, compared to a negative co-efficient obtained by the first approach. This result implied that the past flow of funds remains a key predictor of subsequent flows under changing market conditions. Consistent with results obtained through the difference GMM technique, past performance's coefficient is positive and insignificant through the two-stage approach. This result suggests that generally, investors' cash allocations to active managers are not driven by fund managers' past performance under changing market conditions. However, prior studies (Huang et al., 2012; Chou & Hardin, 2014) suggest that fund contributors generally pursue recent performance. Unlike results obtained through the difference GMM estimation, the market condition variable shows a negative and insignificant coefficient via the two-stage approach. From the table, the results obtained for fund size through the system GMM technique is similar to evidence obtained under the difference GMM estimation, where it reports a positive and significant coefficient. However, its effect on fund flow appears directionally divergent across the two estimation techniques.

In the context of the system GMM approach, the fund size variable's coefficient is negative compared to a positive coefficient obtained by the first estimation technique, the difference GMM. This finding suggests that the volume of a fund's total net assets influences the investor cash allocation decisions under changing market conditions. This result contrasts evidence obtained by Ferreira et al. (2012), which suggests that investors are more confident

when fund managers' asset base is adequately large, as large funds have an advantage of more investment opportunities over smaller funds. They can withstand dynamic market fluctuations. However, the evidence obtained for fund size via the system GMM approach is consistent with the earlier finding by Chou and Hardin (2014), which suggests that an increase in fund size deteriorates the general performance of funds, including fund flow.

Evidence from the system GMM estimation shows a negative and insignificant co-efficient for fund age, which is similar to results obtained by the difference GMM approach. This finding implies that mutual fund investors generally do not consider the number of years a fund has been in existence when making investment decisions in the context of changing market conditions. This evidence contrasts the findings of prior studies (Pástor et al., 2015; Rao et al., 2016) that fund contributors' preference is influenced by fund age because older funds grow slower than younger funds. Given that this study is conducted in changing market conditions, the current results are expected as investors adapt to market dynamics with time, as explained under the AMH (Lo, 2012). From Table 3, the system GMM estimation reports a positive and significant coefficient for the standard deviation of daily fund market returns, which is similar to results obtained for the equal variable via the difference GMM. However, the coefficient of this variable is positive in this context compared to a negative value obtained under the difference GMM approach. This result implies that the mar-

Table 3. GMM results of flow-performance dynamics under different market conditions

Source: Authors' estimations (2020).

Independent variables	Dependent variable: Flow					
	Coefficients		Standard errors		*p*-values	
	Difference	Two-stage system	Difference	Two-stage system	Difference	Two-stage system
FLOW (t−1)	−0.956***	0.238***	0.223	0.077	0.000	0.002
PERF (t−1)	9.423	0.037	8.180	0.986	0.379	0.717
MKTCON (t−4, t−1)	294.190**	−0.908	157.112	0.986	0.051	0.357
LNTNA (t−1)	1478.394***	−0.184***	603.589	0.088	0.000	0.010
LNAGE (t−1)	−89.656	−0.018	125.927	0.276	0.563	0.947
STDMKT (t−4, t−1)	−508.404***	1.409***	259.736	0.708	0.000	0.007
STDFND (t−4, t−1)	8387.451	−131.056***	1757.392	61.555	0.312	0.013
Prob. (J-statistic)				0.095		
AR (2) test (*p*-value)				0.298		
Hansen test of over-identification (*p*-value)				0.191		
Diff-in Hansen test of exogeneity (*p*-value)				0.984		

ket's overall volatility significantly affects the subsequent fund flow of asset managers, as evidence by Barber et al. (2016).

Lastly, lagged dispersions in fund returns (proxied by annualized standard deviations of monthly fund returns) show a negative and significant coefficient via the system GMM technique, which differs from a positive and insignificant coefficient of this variable obtained under the difference GMM approach. The result suggests that an increase in fund returns dispersions adversely affect fund flow under changing market conditions. This evidence is consistent with prior studies' position (Li et al., 2013; Jun et al., 2014) that fund contributors consider portfolio risk when making stock-picking decisions on mutual funds.

3.4. Flow-performance with changing conditions from the fund market

Table 4 reports the results of GMM estimations for flow-performance with changing conditions from the fund market. From the difference GMM results, lagged performance reports a negative and insignificant coefficient. This finding suggests that active managers' past performance does not influence their subsequent cash flows under changing the fund market conditions. This result departs from the expected positive and significant relationship between fund performance and subsequent flows under bullish conditions of the market, as documented by Gottesman et al. (2013). Given that the current analysis is conducted under changing conditions from the fund market and not the general equity market, this result is not surprising. The lagged flows by difference GMM estimation report a negative and insignificant coefficient from the table. This result implies that lagged flows do not drive subsequent mutual fund flows under changing conditions from the fund market. However, evidence by Cashman et al. (2014) suggests that recent fund flow pattern of active manager influence their future fund flows, where lack of persistence in flow patterns affect the direction of flow-performance sensitivity.

Lagged fund size is observed to have a progressive relationship with fund flow under changing conditions from the fund market, as it reports a positive and significant coefficient. This finding implies

that an increase in the number of assets under the management of active managers leads to a positive impact on their subsequent fund flows, as asset allocators' confidence is reinforced to pick stocks with managers with large asset bases. As posited in the literature (Ferreira et al., 2012; Barber et al., 2016), large funds can withstand dynamic market shocks and benefit from economies of scale due to their large trade volumes. From Table 4, lagged annualized standard deviation of monthly fund returns obtained a negative and insignificant coefficient under difference GMM. This result suggests that fund contributors are less sensitive to fund returns dispersions under changing fund market conditions. This evidence contrasts the literature's position that investor preference relative to mutual fund investments is affected by fund portfolios' associated risk (Jun et al., 2014). This result is expected as the fund market's changing conditions may not be the same as changing conditions of the general market to engender generalized assumptions.

From Table 4, lagged annualized standard deviation of daily market returns reports a positive and significant coefficient under both difference and two-stage GMM approaches. This evidence implies that market risk generally positively affects fund flow as the variable for market risk. Intuitively, an increase in the dispersion of benchmark returns drives flows to active managers' portfolios under changing fund market conditions. Evidence by Barber et al. (2016) suggests that investors' cash allocation decisions on mutual funds are influenced by market risk, and hence the finding of this study is consistent with the position of extant literature. Beyond market risk, it can be observed from the table that the lagged fund age of funds exerts a negative and significant effect on fund flow under changing conditions from the fund market through difference GMM estimation. This result differs from evidence obtained for this variable under changing conditions of the general market; its effect was insignificant through both the difference and two-stage GMM approaches.

The current evidence is consistent with the position of Bergstresser and Poterba (2002) that older funds are less capable of attracting new investor cash flow because they grow at a relatively slower pace compared to younger and emerging funds

Table 4. Flow-performance with changing conditions from the fund market

Independent variables	Dependent variable: Flow					
	Coefficients		Standard errors		*p*-values	
	Difference	Two-stage system	Difference	Two-stage system	Difference	Two-stage system
FLOW (t–1)	−0.374	0.238***	0.326	0.069	0.000	0.645
PERF (t–1)	−0.054	−0.022	0.072	0.062	0.379	0.725
FNDCON (t–4, t–1)	1.001***	−0.179	0.412	0.680	0.012	0.537
LNTNA (t–1)	22.073***	−0.145**	6.242	0.084	0.000	0.053
LNAGE (t–1)	−6.923**	−0.072	3.922	0.320	0.053	0.822
STDMKT (t–4, t–1)	5.498***	1.051***	2.586	0.561	0.000	0.001
STDFND (t–4, t–1)	8387.451	−131.056***	1757.392	61.555	0.312	0.000
Prob. (J-statistic)	0.572					
AR (2) test (*p*-value)	0.186					
Hansen test of over-identification (*p*-value)	0.241					
Diff-in Hansen test of exogeneity (*p*-value)	0.996					

(as cited in Jun et al., 2014, p. 16) and reinforced by the findings of Pástor (2015). As shown in Table 4, the coefficient of the market condition variable is positive and significant. This result affirms the prior assumption that fund contributors' stock-picking actions increase significantly during periods of high fund cross-sectional performance than during low cross-sectional fund performance periods. Comparing the results of the difference GMM to the two-stage system GMM estimations, it is evident that lagged fund flow, fund size, market risk, and fund risk have a significant effect on fund flow under the difference estimation technique. On the other hand, lagged flow and market risk exert a positive effect on future fund flows, while fund size and fund risk negatively affect fund flow via the two-stage system GMM approach.

CONCLUSION AND POLICY IMPLICATIONS

This study presents original perspectives on the relationship between mutual fund flow and performance under different conditions of the general equity and fund markets in South Africa. It is found that factors other than past performance drive investor assets to equity fund managers. This finding is evident in the lack of significance in the effect of past performance on subsequent fund flows, which is linked to the prevalence of convexity in the flow-performance relationship. The study found that lagged fund flows, fund size, fund risk, and market risk drive future fund flow under changing conditions of the general market and fund markets. Moreover, this study's findings support the position of the literature that flow-performance sensitivity is more pronounced under bullish market conditions than bearish market conditions. In general, this study concludes that fund contributors and asset administrators adapt to prevailing market dynamics relative to trading decisions, and as a result, affirms the normative guidelines of the Adaptive Market Hypothesis. This makes fund managers rely on non-performance metrics such as advertising a superior means of engendering sustainable fund flows under changing market conditions, which should focus on future studies. This study contributes to the literature on mutual funds by being the first to provide novel perspectives on the relationship between fund flow and performance under different conditions of the general equity market and the fund market in South Africa.

AUTHOR CONTRIBUTIONS

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