"Investigating key funds characteristics influencing their investment performance in Saudi Arabia: A dynamic panel data approach"

AUTHORS	Samira Ben Belgacem (iD)
	Wafa Ghardallou (iD)
	Razan Alshebel

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BUSINESS PERSPECTIVES

Samira Ben Belgacem, Assistant Professor, College of Business Administration, Department of Business Administration, Princess Nourah Bint Abdulrahman University, Université de Jendouba Faculté des Sciences Juridiques Economiques et de Gestion de Jendouba, Jendouba, Tunisia. (Corresponding author)

Wafa Ghardallou, Assistant Professor, College of Business Administration, Accounting Department, Princess Nourah Bint Abdulrahman University, Orleans Economics Laboratory (LEO), University of Orleans, France.

Razan Alshebel, Lecturer, College of Business Administration, Department of Business Administration, Princess Nourah bint Abdulrahman University, Saudi Arabia.

Samira Ben Belgacem (Tunisia), Wafa Ghardallou (France), Razan Alshebel (Saudi Arabia)

INVESTIGATING KEY FUNDS CHARACTERISTICS INFLUENCING THEIR INVESTMENT PERFORMANCE IN SAUDI ARABIA: A DYNAMIC PANEL DATA APPROACH

Abstract

The study examines if specific characteristics of funds influence the performance of Saudi equity mutual funds. Previous research has explored various aspects of mutual funds. However, the Saudi Arabia literature focuses on evaluating the funds' performance. Hence, this study seeks to close this gap by providing a framework to explain the equity fund performance. Several risks adjusted performance measures are applied such as Jensen's alpha, lower partial moment alpha, Sharpe ratio, LPM-Sharpe ratio using the dynamic panel specification over the period 2010–2019. Based on the LPM alpha, the risk-adjusted return analysis reveals that the Saudi equity funds outperformed their benchmark over the full sample period. The empirical results show that major fund-specific characteristics such as fund size, past performance, and flow explain future performance. Besides, the evidence confirms that Saudi funds benefit from the economies of scale and expertise, while funds requiring higher levels of initial investment tend to exhibit lower performance levels. These findings provide investors and fund managers with useful information to make the optimal investment decisions in the mutual fund industry.

Keywords	emerging markets, performance determinants, LPM alpha, LPM-Sharpe ratio, performance persistence, fund size, management fee, fund age
JEL Classification	G23, G12, G11

Introduction

For a long time, the collective management industry has played a significant role in the global financial markets, and investor demand for regulated and professionally managed funds has skyrocketed in recent years. In 2019, the total worldwide assets invested in open-end funds were approximately USD 54.9 trillion, roughly double the total investment of USD 28.4 trillion in 2011 (Investment Company Institute, 2020). In that regard, investors who have liquidity constraints can thus indirectly expose themselves to less liquid assets through an investment in a liquid and well diversified fund. With such influence on financial markets, it is vital for investors and financial regulators to understand the performance of mutual funds as this performance is a potential source of expansion of investment flows, in particular, to emerging markets like the KSA market. In fact, since the unveiling of Vision 2030, the speed and scope of changes in the Saudi financial market have been extraordinary. Accordingly, Saudi Arabia encourages the establishment of well-developed and open capital market, which provides greater financial resources and stimulates economic growth. The industry of mutual funds in KSA has grown substantially in total

assets and trading value since the first mutual fund under the name of "AlAhli Short Term Dollar Fund" in December 1979, to more than 634 funds with total asset value exceeded 348 billion riyals in 2020 (Saudi Capital Market Authority Report, 2020). The relevance of the study is demonstrated by mutual funds' substantial role, as well as insufficient financial literacy, especially among ordinary retail investors. The latter are still seen as oriented or misdirected by the widespread belief that a higher expense ratio will always result in greater outcomes. When making investment decisions, they can also be led by the enormous fund size and higher returns without considering the fund's risk. In this respect, this study helps to clarify and inform potential investors about investment opportunities in Saudi funds, as it discusses the main factors that allow predicting fund performance using various risk-adjusted measures.

1. LITERATURE REVIEW AND RESEARCH HYPOTHESES

1.1. Research problem

Previous studies have emphasized the relationship between funds' specific characteristics and their performance such as fund size (Ferreira et al., 2012), expense ratio (Bello & Frank, 2010), fund age (Babbar & Sehgal, 2018), and flows (Zheng, 1999; Rakowski, 2003). Another strand suggested an alternative approach based on the analysis of possible explanations on the performance differences in funds with different initial deposits, and opting for different marketing strategies (Walsh, 2004; Payne et al., 1999). Furthermore, the study of the literature is generally based on classical regression methods reflecting how explanatory factors are linked to fund performance (Golec, 1996; Gilbertet al., 2019). However, several empirical studies highlighted that investors tend to select funds with subsequent good performance[1] (Gruber, 1996; Matos et al., 2012; Dumitrescu & Gil-Bazo 2018). Consequently, classical tools may not be directly implemented when we consider the past return-chasing trading behaviors of investors. Moreover, the investor's demand across the globe for emerging funds has been bolstered over the last decades (Lamphun & Wongsurawat, 2012; Baghdadabad, 2015; Khan et al., 2016; Milena et al., 2017).

In this context, this study complements the existing literature by investigating the effect of fund characteristics on fund performance in the emerging market such as Saudi Arabia[2], as this relationship as received less attention in this fund industry. Indeed, the study applies a dynamic specification tool (GMM approach) that has advantages over fixed effect panel data method. It allows controlling the past return-chasing trading behaviors of investors (Arellano & Bond, 1991). The study also contributes to the literature by providing useful information for domestic and foreign investors, fund managers and financial regulators to understand the association between crucial specific factors and fund performance, allowing them to make optimal investment decisions in the Kingdom Saudi Arabia (KSA) fund industry. Particularly, do KSA funds earn superior performance relative to their benchmark? Does KSA fund's performance vary with the fund-specific characteristics? Is the KSA fund's performance related to its past performance, or are there important differences among mutual fund performances due to the different managers' skills?

This study examines these questions by testing the effect of fund features on the performance of the KSA funds, resulting in a more complete picture. The next section provides a rich academic literature on the determinants of fund performance. The methodology, the nature of the data, the statistical summary, as well as the results of the regression analysis, are then discussed. Finally, the conclusion is presented, along with future prospects.

1.2. Theoretical background and research hypotheses

Investor demand for mutual funds has risen dramatically over the world, highlighting the need for

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1   According to Barber et al. (2005), this may in part be explained by the fact that individual investors face significant research and information costs.

2   Emerging markets can refer to developing countries experiencing strong economic growth, Brazil, China, India or Southeast Asia, as well as countries newly opened to the global market such as KSA. They offer an advantage of benefiting from sustained economic growth, and the returns generated are regularly well above those of developed markets.

accessible information and skilled management services. The performance of mutual funds was studied using various studies and public reports for various years. They have identified numerous factors that have influenced fund performance during the last decade.

In this context, even if investors' behaviors differ greatly, they tend to use the same tools, which are typically based on a fund rating system. These ratings are quantitative and are based on past performance (see, e.g. Morningstar rating). It is then necessary to determine whether past performance is predictive of future performance. Thus, previous empirical studies have largely focused on testing the persistence of fund performance, and their results are more diverse. Several researchers claimed that the past fund performance may affect the future financial performance (Elton et al., 1996a; Matos et al., 2012; Kalpakam & Smita, 2018). In addition, they showed that the best performing managers during a study period tend to earn better returns. This may partially explain why fund selection is often based on past performance, although historical results do not accurately predict the future fund performance (Gruber, 1996; Carhart, 1997; Hendricks et al., 1997; Brown & Goetzmann, 1995). According to other studies, performance persistence is also dependent on the methodology applied to rank funds based on prior returns (Bollen & Busse, 2004; Budiono & Martens, 2009). However, certain studies asserted that past performance cannot be used to predict the level of fund managers' skills (Barras et al., 2010).

Moreover, studies have indicated that fund-specific characteristics can explain the performance differences in emerging funds. They asserted that the expense ratio negatively affected the fund performance (Goel et al., 2012; Elton et al., 1996a; Bello & Frank, 2010; Mansor et al., 2015). On the contrary, other studies have not found any significant relationship between fees and performance (Ippolito, 1989; Low, 2010; Chen et al., 2004). In particular, Ippolito (1989) demonstrated that funds with greater fees also earn better returns, and that both effects are balanced. Kaur (2018) reported similar findings, demonstrating that the expense ratio had an impact on Indian mutual fund trading strategy but not on performance.

Furthermore, fund size also has broad implications on performance evaluation. Some academic and professional studies test the direct impact of the fund size on its performance and obtained various findings (Golec, 1996; Payne et al., 1999; Matos & Rocha, 2009). Others explain the nature of this relationship by economies (or diseconomies) of scale in collective management (Latzko,1999; Wang, 2002; Grinblatt & Titman,1989b; Dahlquist et al., 2000; Bikker et al., 2012; Chen et al., 2004, Ferreira et al., 2012). Theyargue that while larger funds are more expensive to run, the cost increase is not linear. More recently, Gilbertet al. (2019) support the existence of economies of scale in KiwiSaver funds due to the increase in membership not to the size.

The fund's age represents the viability, stature and sincerity of investors and it might affect its performance. As discussed in Ferreira et al. (2012), the age can affect fund performance in both directions: younger funds can be more resilient and bound to earn higher returns. However, the startup phase displays high operating expenses for younger funds due to their lack of managerial experience. Several studies provide direct evidence of a strong association between age and fund performance showing the existence of economies of experience (Babbar & Sehgal, 2018; Blake & Timmermann, 1998; Ferreira et al., 2006; Goel et al., 2012; Afza & Rauf, 2009). In particular, Babbar and Sehgal (2018) and Singh and Tandon (2021) found a positive association between fund age and fund's performance in India.

Investors' decisions might also depend on capital flows that appear reflecting specific information about future performance. Zheng (1999) and Gruber (1996) affirm that investors' demand is sensitive to the recent past performance, and historical performance is useful to predict future performance, so capital flows may contain information that can be used to earn abnormal returns. In addition, Edelen (1999) shows that the underperformance of mutual funds is due to the costs of liquidity-motivated transactions measured by fund flows. It is expected that future performance can be negatively affected by capital flows. Particularly, two explanations have been broadly declared for the negative correlation between flows and future performance (Rakowski, 2003): Fund managers

can face the problem to manage efficiently when liquidity is requested at an inopportune time forcing them to sell less liquid assets at unfavorable prices or due to "diseconomies of scale" factor.

Previous studies have also emphasized the classification of funds according to certain marketing variables and initial deposits. Especially, Walsh (2004) asserted that marketing activities are clearly oriented towards enhancing fund performance, which is attributable, on the one hand, to the new inflows into the fund that decrease the operating costs through economies of scale, and on the other hand, to the decrease in liquidity costs through lower flow volatility. Indeed, considering that funds that require a higher minimum volume of investment have a competitive advantage over funds that require a smaller minimum value (Payne et al., 1999), the study seeks to examine how this competitive advantage is associated with fund performance. In this regard, the results of Payne et al. (1999) do not support the affirmation that efficiency gains from higher required initial investments are reflected in overall fund performance. However, Aragon (2007) found a positive relationship between fund performance and initial minimum investment.

Based on the previous findings, this study attempts to explore different fund characteristics and outline the key attributes that may predict the future performance of Saudi mutual funds. Thus, the following hypotheses are formulated:

H1:   *Historical performance predicts future performance of the fund.*

H2:   *Fund performance declines with fund fees.*

H3:   *Size affects positively future performance.*

H4:   *Fund age is positively associated with future performance.*

H5:   *New money erodes mutual fund performance.*

H6:   *Stock investment funds that require higher initial investment earn better performance.*

H7:   *Marketing activities have a positive influence on fund performance.*

1.3. Data description and methodology

Since the release of Vision 2030, there is a clear strategy to diversify the country's resources by encouraging national and international investments in the local stock market. Indeed, it is important to note that the Saudi stock market is the seventh largest stock market globally. It is the largest securities exchange in the Middle East. The country aims to become a leader in competitive asset management and financial investment. Thus, the study focuses on Saudi mutual funds given their local and worldwide importance in terms of number and total net assets invested. It emphasizes the impact of fund-specific factors previously examined on future performance. Firstly, a sample of domestic open-end equity funds operating in KSA is chosen. Secondly, a dynamic panel data specification is applied to estimate the parameters of the following basic regression.

1.4. Data description

The study specifically seeks to evaluate and analyze the performance of Saudi equity funds in comparison to their respective benchmarks. The difference among funds performance may be attributed to different trading decisions applied. Therein, risk-adjusted performance is measured using a mean-variance model and the lower partial moment measure (LPM-alpha) (Bawa & Lindenberg, 1977). The market factor is measured by the daily value of Tadawul All Share Index (TASI), and the risk free rate of return for year "t" is proxied with one-month Treasury bill (T-bill) return. The sample includes all KSA locally equity funds that were classified into two subsamples: Growth funds and Growth and income funds, according to their risk tolerance (see, Tadawul classification). Individual data on equity mutual fund characteristics such as fund size, net asset value, age, flow, minimum of investment, and fees is sourced from the Bloomberg database and Tadawul over the period 2010–2019. To prevent survivor bias, all observations on both operative and inoperative funds are included. Several studies have confirmed the economic significance of survivorship bias in overestimating funds performance (Elton et al., 1996; Otten & Bams, 2004). From the total of 91 equity funds identified, 61 met all the criteria.

Table 1. Descriptive statistics on mutual fund-specific characteristics and subsample fund return distribution

Fund-specific characteristics	Mean	Standard deviation	Minimum	maximum	Skewness
TNA (SAR million)	365,521,836.20	1.831545	1,569,900.	1,931,313,100.	−.0345422
FLOW (%)	.0637671	2.044829	−3.56700	92.18849	.0453812
Fund's age (years)	5.1.6992820513	33.1739384	2.33	9.33	−.2222964
Management fees (%)	6.200.000	0.191723	1	2	−.4569957
Minimum initial investment (SAR thousand)	.5310606	.7478092	1.000	10.000	−.1706228
SBANK		.4990973	0	1	−.1244828
Fund's return					
Entire sample	0.03735321	3.4077449	−0.0078061	0.0414499	−22.51067
Growth funds	0.03680072	4.3964898	−0.0068061	0.0414499	12..26245
Income and Growth funds	0.0212466	2.0458279	−0.0039322	0.03046416	−2.136817

Notes: The table summarizes descriptive statistics of fund-specific characteristics selected for this study during the period 2010–2019. Funds younger than two years are excluded. It also includes the descriptive statistics on the sub-samples' return distribution. Data is collected from Bloomberg and Tadawul.

There is no information about flow of funds in database. Thus, the following calculation is applied (see, e.g., Chevalier & Ellison 1997; Sirri & Tufano, 1998) that defined flow as a net percentage growth of fund assets.

$$FLOW_{it} = \frac{TNAV_{it} - TNAV_{it-1}}{TNAV_{it-1}} - r_{it}, \qquad (1)$$

where $TNAV_{it}$ is the fund total net asset value on day t, and r_{it} is fund i's daily rate of return. Brief descriptive statistics of variables in the database are presented in Table 1.

Table 1 presents the average fund characteristics in the sample. The skewness value is used to determine whether the data set is normally distributed. Generally, if the skewness is 0, the data is perfectly symmetrical. However, if the skewness value exceeds 1, it is considered not normally distributed. According to the table, the distributions of the various variables are normal. The average size of funds is 365 million SAR with a maximum of 1931.313 million SAR and a minimum of about 1.569 million SAR. The mean rate of the new money to KSA funds is 6.37% per year. The mean age of funds is 5.92 years, the average minimum initial investment is 6.200 thousand SAR, and the average management fee is 1.69%. Finally, the dummy variable *SBANK* (Bank sponsored; non-bank sponsored) is used that takes a value of 1 if the fund is listed as affiliated with a bank and zero if the fund is not sponsored by a bank. Overall, 53% of funds are marketed by banks. Furthermore, the skewness coefficients for all fund groups reveal

that the return distribution is asymmetric. The results also indicate that the equity-local funds earned a daily average return of 3.73%. Indeed, the growth funds earned higher mean returns of 3.68% than the income and growth group. It can be noticed that the standard deviation of daily returns for income and growth funds is the lowest. This study expected this result because the asset classes selected by this subsample are less risky.

1.5. Methodology

1.5.1. Fund performance measurement

As previously stated, the study investigates the variables that can predict future fund performances. The explicative variable is performance, $PERF_{it}$, of fund i in year t attributable to the selective and anticipative market ability of the manager. Firstly, Jensen's alpha (1968) and the Sharpe ratio (1966) are computed to evaluate a manager risk-adjusted performance in year t. The Sharpe ratio uses variance or standard deviation as a measure of risk, whereas Jensen's alpha uses beta of the portfolio as a measure of risk. These measures are widely used by academics and practitioners.

The regression equation applied to estimate alpha for each fund for the year "t" is as follows:

$$R_{pt} - R_f = \alpha_p + \beta_p(R_{mt} - R_f) + e_{pt}. \qquad (2)$$

Sharpe ratio (or reward-to-variability ratio) is the portfolio performance measure that represents

the reward per unit of total risk. Thus, the performance for each fund for the year "t" can be measured using the Sharpe ratio as follows:

$$S_p = \frac{E(R_p) - R_f}{\sigma(R_p)}, \quad (3)$$

where R_p = average return on the fund, R_f = risk-free rate, and σ_p = standard deviation of the fund return.

Secondly, several empirical results have shown that the distributions of returns are rather asymmetric. In particular, bond yields in some emerging countries are characterized by a negative skewness coefficient (Bekaert et al., 1998; Burger & Warnock, 2007). Previous research findings (Table 1) also support this evidence as the distribution of Saudi funds' returns appears to be asymmetric over the study period. Thus, it seems necessary to introduce higher order moments in the investment choice for considering the non-normality distributions of certain assets, as well the investor's behavior regarding the risk. The LPM-Jensen's measure (LPM-J) and the LPM-Sharpe ratio (LPM-S), also known as the Sortino ratio (Sortino & Van der Meer, 1991), are used to calculate fund performance for risk-averse investors with asymmetric preferences. The LPM-J for each fund for the year "t" is obtained by applying the following regression model:

$$\alpha_{LPM2p} = R_p - \left[R_f + \beta_p^{LPM2} \left(E(R_M) - R_f \right) \right]. \quad (4)$$

The LPM-S for each fund for the year "t" is calculated as:

$$S_{LPM2} = \frac{E(R) - R_f}{\sqrt{SV_p}}, \quad (5)$$

where R_p, R_M, and $\sqrt{SV_p}$ represent the fund return, the market return and the square root of the semi-variance, respectively.

For each subsample of KSA equity funds, statistical summary on the fund's performance, as well on TASI, is presented in Table 2.

Table 2 reports the results on fund performance using Jensen's alpha, LPM- alpha, Sharpe ratio and LPM-Sharpe ratio as indicators of risk-adjusted performance. It highlights some of the basic similarities and differences across subsamples. Firstly, the results show that two subsamples (entire sample and growth funds sample) had LPM-beta lower than CAPM-beta, indicating that there is a tendency to overestimate mutual-fund risk by using CAPM-beta rather than LPM-beta, which is the appropriate risk-measure when return distributions are not normal, as it is in most cases. To assess whether the fund returns outperform the market return index TASI, the estimated alpha and the Sharpe ratio for each subsample are ex-

Table 2. Summary statistics on performance measurement by fund groups

Performance measures	Entire sample	Growth funds	Income & growth funds
Sharpe ratio	0.03018	−0.02227	0.01616
LPM-S	0.11116	0.15067	−0.08061
Alpha	−0.00394	−0.00448	−0.00136
t-Student	−1.32	−1.44	−1.88
Alpha (LPM)	0.0720	0.00448	−0.00136
t-Student	2.06	1.99	−1.33
beta	0.487	0.686	0.395
LPM-beta	0.422	0.678	0.402
R-squared	0.469	0.479	0.421
R-squared (LPM)	0.554	0.522	0.541
Sharpe ratio TASI		0.10712	
LPM-S TASI		0.09139	

Notes: The table reports statistical summary on the financial performance for the entire sample, as well as for each subsample of KSA equity funds. The parameters are estimated for each regression (CAPM & CAPM LPM). The Sharpe ratio and the LPM-Sharpe ratio are computed for each subsample and for the market index TASI.

amined. The findings indicate that all subsamples of KSA domestic funds did not generate superior relative performance using the CAPM-measures (the coefficient alpha is negative; Sharpe ratios of all fund groups are lower than those of the TASI). The study supports the evidence that fund managers cannot consistently beat the market (see, e.g., Jensen, 1968; Ferson & Schadt, 1996). Finally, using R-squared values, daily returns of the funds seem to be most explained by LPM-CAPM. According to Hwang and Pedersen (2004), for higher frequency returns, which are highly non-normal, the LPM-CAPM is often chosen instead of the CAPM. It is also noteworthy that a different result is observed when LPM alpha and LPM-Sharpe ratios are chosen, which indicates a significant outperformance for the growth and total samples. Overall, the risk-adjusted returns analysis based on LPM-measures shows that there is evidence that the KSA equity funds outperformed their benchmark over the full sample period.

1.5.2. Statistical model to predict fund performance

The explicative and explanatory variables included in the statistical model have been derived from the theory of performance. Daily fund returns denominated in KSA Riyal from January2010 through December 2019 are used to compute α_p, α_{LPM2p}, S_p, and $LPM-S$ for each year "t". Thereby, the determinants of Saudi funds performance are examined using the following regression[3]:

$$PERF_{it} = \alpha_0 + \alpha_1 PERF_{it} +$$
$$+\alpha_2 LogTNA_{it} + \alpha_3 FLOW_{it} + \quad (5)$$
$$+\alpha_4 LogAGE_{it} + \alpha_5 FEES_{it} +$$
$$+\alpha_6 LogMININV_{it} + \alpha_7 Sbank_{it} + e_{it},$$

where t = 2010, 2011, 2012, 2013......2019; i = 1, 2, 3...61 (number of funds); $FEES_{i,t}$. Reward for a manager's efforts in running the fund is expressed as a percentage of asset management; $LOGAGE_{i,t}$ Natural logarithm of fund longevity (or fund age) is measured by the span of time (in years) in fund

management; $LOGTNA_{i,t}$ is the natural logarithm of the net asset value; $FLOW_{it}$ denotes flows of individual funds; $LogMininv_{it}$ is a natural logarithm of minimum initial investment required; $SBANK_{it}$ (Sponsored bank dummy) is an indicator variable for detecting the impact of marketing effect on future performance. It divides the sample into funds that are sponsored by a bank and those not sponsored by a bank; $PERF_{it-1}$ denotes last year fund performance.

2. EMPIRICAL RESULTS

The study focuses on testing the effect of selected fund-specific characteristics on future performance. For each performance indicator, the parameters of the statistical model (1) are estimated. Moreover, the correlation matrix is determined and the correlation coefficient and VIF values are checked to verify the multicollinearity of the independent variables. Table 3 shows summary of Karl Person's correlation co-efficient matrix during the study period between past fund performance $(PERF_{t-1})$, fund size (TNA), flows in funds (Flow), fund's age (Age), management fees (Fees), minimum initial investment (MININV) and SBANK. It is clearly shown that there is no significant correlation between the explanatory variables: the average variance inflation factor (VIF) is 1.55 with maximum VIF of 2.36.

The results of examining the relationships between the performance of KSA equity funds and its major determinants are presented in Tables 4.

Table 4 reports the estimated coefficients of fund performance for the full sample. The estimates of GMM are only efficient if over identifying restrictions are valid. According to the Sargan test (p-value for J-statistic), the null-hypothesis of validity of over-identifying restrictions is accepted at a 10% significance level. AR (1) and AR (2) test results show first-order serial correlation on first difference errors, and the dependent variable's one-lag is then taken into account. The results support the evidence that there is a strong positive association between past performance and future perfor-

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[3] To control for the past performance, this study applied the linear dynamic panel data (LDPD) analysis that has become increasingly popular due to its ability to take into account both the short and long-term effects and to control for potential biases without relying on strictly exogenous instrumental variables, which in many empirical cases are impossible to obtain (Anderson & Hsiao, 1981).

Table 3. Correlation matrix and variance inflation factor

	$perf_{t-1}$	TNA_{t-1}	$flow_{t-1}$	age_{t-1}	$fees_{t-1}$	$MININV_{t-1}$	$SBANK_{t-1}$	Variable	VIF
$PERF_{t-1}$	1.0000								
TNA_{t-1}	0.1299	1.0000						TNA_{t-1}	2.31
$flow_{t-1}$	0.0079	0.0176	1.0000					$flow_{t-1}$	1.00
age_{t-1}	0.0639	0.3326	−0.0049	1.0000				age_{t-1}	1.22
$fees_{t-1}$	0.1514	0.2237	0.0148	0.3707	1.0000			$fees_{t-1}$	2.36
$MININV_{t-1}$	−0.2232	−0.1108	−0.0223	0.0658	−0.0645	1.0000		$MININV_{t-1}$	1.09
$SBANK_{t-1}$	0.0227	0.4359	0.0006	0.3382	0.4637	−0.0188	1.0000	$SBANK_{t-1}$	1.33
								Mean VIF	1.55

Notes: The table shows a summary of Karl Person's correlation coefficient matrix of KSA domestic funds during the study period between the explanatory variables.

Table 4. Influence of fund-specific factors on future performance for the full sample

	α_p	α_{LPM2p}	S_p	$LPM - S_p$
$perf_{t-1}$	.335***	.435***	.117***	.222***
	(0.000)	(0.000)	(0.000)	(0.000)
$fees_{t-1}$	−.0049	−.001	−.0028	−.031
	(0.147)	(0.171)	(0.172)	(0.175)
age_{t-1}	.0512	.0123*	.0302*	.0079
	(0.278)	(0.060)	(0.074)	(0.338)
$MININV_{t-1}$	−.334***	−.200***	−.334***	−.200***
	(0.000)	(0.000)	(0.000)	(0.000)
$flow_{t-1}$	−.009	.021**	.007**	.001
	(0.422)	(0.030)	(0.012)	(0.330)
TNA_{t-1}	.017*	.016*	.017*	.016*
	(0.082)	(0.060)	(0.082)	(0.056)
$SBANK_{t-1}$	.364***	.412***	.364	.412*
	(0.003)	(0.006)	(0.260)	(0.056)
J-statistic (Sargan test)	4.945*	4.231*	4.945*	4.231*
	(p=0.065)	(p=0.076)	(p=0.085)	(p=0.060)
AR(1)	−4.291***	−3.752***	−4.661***	5.723***
	(p=0.000)	(p=0.0000)	(p=0.000)	(p=0.0000)
AR(2)	−0.2928	0.7522	1.6542	−0.3332
	(p=0.229)	(p=0.347)	(p=0.344)	(p=0.447)

Notes: This table reports the estimation results from the two-step Arellano-Bond LDPD estimators. The four performance indicators are presented in the first row. The β_i coefficients are presented in the first row and the probabilities of t-value are the numbers in parentheses, respectively. Each statistic's probability on the tests applied is in parentheses. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively. The reference period is January 2010.

mance regardless of the performance indicator applied (The $perf_{t-1}$ coefficient is 0.335 for the alpha and 0.435 for the LPM alpha; (leading to acceptance of the research hypothesis (H1)). The results show also that fund size is positively related to the future performance in the sample of KSA funds indicating that larger funds are associated with higher performance in the following year (lead-

Table 5. Influence of fund-specific factors on future performance for the two subsamples: Growth funds/Income & growth funds

	Growth Funds				Income & Growth Funds			
	α_p	α_{LPM2p}	S_p	$LPM - S_p$	α_p	α_{LPM2p}	S_p	$LPM - S_p$
$perf_{t-1}$	.682***	.300***	.412***	.300***	.524***	.244***	.424***	.208***
	(0.000)	(0.002)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)
$fees_{t-1}$	−.006	−.009	−.004	−.079	−.012	−.065	−.019	−.077
	(0.192)	(0.185)	(0.262)	(0.215)	(0.221)	(0.317)	(0.221)	(0.317)
age_{t-1}	.599**	.400*	.599**	.299*	.108	.323**	.238	.313**
	(0.039)	(0.062)	(0.028)	(0.082)	(0.261)	(0.022)	(0.431)	(0.031)
$MININV_{t-1}$	−.753***	−.102*	−.443***	−.099	−.348***	−.013**	−.318***	−.003**
	(0.000)	(0.060)	(0.000)	(0.320)	(0.000)	(0.032)	(0.000)	(0.030)
$flow_{t-1}$	.961*	.845*	.661	.544*	.013*	.008*	.013*	.018**
	(0.528)	(0.080)	(0.428)	(0.070)	(0.061)	(0.074)	(0.071)	(0.064)
TNA_{t-1}	.028**	.0030**	.032**	.0028**	.001**	.002**	.011**	.002**
	(0.026)	(0.041)	(0.036)	(0.049)	(0.020)	(0.022)	(0.021)	(0.042)
$SBANK_{t-1}$	.463	.200	.422	.190	.603	.300	.593	.230**
	(0.234)	(0.530)	(0.428)	(0.342)	(0.704)	(0.822)	(0.704)	(0.022)
J-statistic	4.845*	4.231*	4.645*	3.222*	−4.656*	4.236*	5.345*	3.432*
	(p=0.065)	(p=0.076)	(p=0.068)	(p=0.076)	(p=0.077)	(p=0.066)	(p=0.078)	(p=0.069)
AR(1)	5.291***	−3.752***	4.292***	−3.822***	−5.433***	−3.222***	5.292***	−4.522***
	(p=0.000)	(p=0.0000)	(p=0.000)	(p=0.0000)	(p=0.000)	(p=0.0000)	(p=0.000)	(p=0.0000)
AR(2)	−0.2928	0.7522	−0.3328	0.6822	−0.3328	0.9522	−0.3528	0.5522
	(p=0.229)	(p=0.347)	(p=0.233)	(p=0.248)	(p=0.299)	(p=0.444)	(p=0.306)	(p=0.528)

Notes: This table reports the estimation results from the two-step Arellano-Bond LDPD estimators. The four performance indicators are presented in the first row. The β_i coefficients are presented in the first row, and the probabilities of t-value are the numbers in parentheses, respectively. Each statistic's probability on the tests applied is in parentheses. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively. The reference period is January 2010.

ing to acceptance of the research hypothesis (H3)). Moreover, fund performance is negatively affected by the management fee, but the effect is not significant (resulting to rejection of the research hypothesis (H2)). Fund age seems to have a positive effect on fund performance, but only for the LPM-alpha and Sharpe ratio (age_{t-1} coefficient is 0.0123 and 0.0302, respectively). This is consistent with the previous findings that young funds may exhibit high operating expenses during the start-up phase due to their lack of managerial experience (leading to acceptance of the hypothesis (H4)). The minimum initial investment required is negatively correlated with future performance. Thus, the results do not support the efficiency gains resulting from larger initial investments, resulting to rejection of the research hypothesis (H6). Not surprisingly, the Sbank coefficient is positive and statistically significant, confirming the well-known finding that marketing activities positively affect fund performance (except for Sharpe ratio). The result also appears to support the positive and strong association between flows and performance (except

for Jensen's alpha), resulting to rejection of the research hypothesis (H5). Saudi funds that receive more flows perform better than those receiving less new capital.

Table 5 presents the results for the two sub-samples of funds: Growth Funds and Income & Growth Funds. The findings pointed out a positive relationship between fund past performance and future performance for all performance indicators in both samples, leading to acceptance of research hypothesis (H1). All regression coefficients on past performance are positive and statistically significant, asserting that investors are looking for the latest performers. The coefficients of fund size are also positive and significant, indicating that large funds benefit from economies of scale, enabling them to enjoy lower management fees and better diversification of their portfolios (leading to acceptance of H3). Interestingly, the results also show that the impact of management fees is always not significant, leading to rejection of (H2). As expected, fund's age appears to positive-

ly influence investor demand for Saudi funds with the exception of Income & Growth Funds, when Jensen's alpha is used as a performance measure (leading to acceptance of H4). Also, the evidence fails to support a positive relationship between minimum initial investment requirements and performance (resulting to rejection of the research hypothesis (H6)). Once again, the flows positively affect future performance, indicating that funds attracting more new capital earn superior performance subsequently: each 1% increase in flows to Growth funds is associated with a 1% improvement in future performance (coefficient is 0.96 for alpha; 0.845 for LPM alpha; leading to rejection of H5).The results show that the effect of marketing activities is dependent upon the performance measure selected and fund groups: a positive relationship between the variable Sbank and future performance is only statistically significant for the LPM-Sharpe ratio and the Growth & Income subsample (leading to acceptance of (H7)). Finally, the testing data, as shown in Table 5, indicate that the statistical regression is effective in relating fund-specific characteristics to the dynamics of their performance.

3. DISCUSSION

The study investigates a variety of fund characteristics, including fund size, management fee, fund age, flows, marketing activities, initial minimum investment requirements, and recent past performance, which may influence the future performance of mutual funds in KSA. The comprehensive examination of previous studies undertaken on fund performance determinants aids in the exploration of the key factors influencing fund performance in KSA. Firstly, the study seeks to evaluate and analyze the performance of 61Saudi equity funds in comparison to their respective benchmark from 2010 to 2019. Difference in fund performances can be attributed to different trading decisions used. Therein, the risk-adjusted performance is measured using the mean-variance model (Jensen's alpha and the Sharpe ratio) and the lower partial moment measures (LPM-alpha and the LPM-Sharpe ratio). It seems necessary to introduce higher order moments in the investment choice for taking in consideration the non-normality distributions of Saudi funds return and the

investor's behavior regarding the risk. The results show that two subsamples of funds had LPM-beta lower than CAPM-beta, indicating that the mutual-fund risk tends to be overestimated by using CAPM-beta rather than LPM-beta. Moreover, a different result is observed when LPM measures are chosen, which indicates a significant outperformance for the growth and total samples. Thus, the study's findings shed new light on mutual fund performance evaluation. Investors can make money by selecting mutual funds based on LPM-measures rather than Jensen's alpha or Sharpe ratio.

Second, applying the two-step Arellano-Bond LDPD method to assess the likely association between fund performance and its specific characteristics, when lagged dependent variable is taken as an independent variable, provides more informative insights. The LDPD estimator is more efficient when there is an AR structure in the data. Thus, another interesting finding of the study is the impact of past-one year performance, size, flow in funds and age on future fund performance. This indicates the presence of the "smart money effect" (Gruber, 1996) and economies of experience in KSA mutual fund industry. Moreover, this evidence documents that funds with greater resources are more aggressive in exploiting market opportunities, altering the portfolio composition and achieving economies of scale (Payne et al., 1999; Belgacem & Hellara, 2011; Zabiulla, 2014). Consequently, KSA large-cap equity funds with deep experience seem to generate superior performance over the study period(most Saudi growth funds exhibits profound managerial experience dating back to 2010). It is noteworthy, that past performance positively influences fund performance for all performance indicators used, which reinforces some previous findings, indicating that recent past performance continues to be a crucial determinant in predicting KSA funds' performance (Elton et al., 1996a; Matos et al., 2012; Kalpakam & Smita, 2018). But this result does not support the evidence that performance persistence depends on the methodology applied to rank funds based on prior returns (Bollen & Busse, 2004). However, the evidence fails to support a significant relationship between management fees and fund performance. This is consistent with the findings of Babbar and Sehgal (2018)

and Low (2010), who concluded that the expense ratio has no effect on fund performance, but do not support the evidence of Singh and Tandon (2021) using Jensen's alpha as an indicator. The minimum initial investment requirements have a statistically detrimental impact on fund outcomes. These findings contradict the study hypothesis that funds with higher initial minimum investment requirements have a competitive advantage over funds that require a smaller minimum value (Aragon, 2007). Finally, the results show that the effect of marketing activities depends on the selected performance measure and fund groups.

CONCLUSION

In the framework of this study, the effect of 61 open-end equity funds' features on their investment performance in the KSA market over the period 2010–2019 is investigated. Using the dynamic panel data specification, the study particularly examines the impact of fund size, management fees, flows, fund age, marketing activities, recent past performance and initial minimum investment requirements on fund investment performance across different Saudi subsamples.

Based on the findings of the study, the conclusions are drawn concerning the impact of fund-specific characteristics. The mutual-fund risk tends to be overestimated by using CAPM-beta rather than LPM-beta. Moreover, a different result is observed when LPM measures are chosen. In particular, applying LPM alpha, the risk-adjusted return results show that KSA equity funds outperformed their benchmark over the full sample period and for all subsamples. Indeed, the results of the estimated regressions reveal that future performances of equity funds are strongly determined by past-one year performance, fund size, fund age, and fund flows among all the subsamples of funds, whereas management fees do not show any significant impact. The evidence supports the presence of economies of scale and economies of experience in the KSA fund industry. The study argues that funds with more resources and more experience are more capable of spreading fixed fees over a large asset base, seeking market opportunities in an aggressive way, altering the portfolio composition, and achieving investors' expectations. It was also possible to verify that investors are paying more attention to the selection of funds that have recently performed well. This finding is consistent with previous arguments that historical performance seems an important source of information for detecting managers' skills in stock-picking and market timing. Moreover, the results showed a positive statistically significant relationship between fund performance and whether the fund is affiliated with a bank, but the effect of marketing activities depends on the selected performance measure and fund groups. This evidence suggests that bank-sponsored funds may outperform, which is consistent with the hypothesis that marketing efforts will attract more flows and hence lower operating costs of running the fund for individual investors. However, the findings contradict earlier studies that funds with higher initial minimum investment requirements have a competitive advantage over funds that require a smaller minimum value. Finally, the results on the three tests applied remain unchanged and confirm the dynamic specification of the research model.

This empirical study is significant as it provides potential investors with a better understanding of the relevant specific characteristics influencing the performance of KSA mutual funds. Further research may include other factors related to the managers' characteristics to conduct a more in-depth analysis of fund performance. The study can be extended to other emerging countries to assess the comparative performance of mutual funds.

AUTHOR CONTRIBUTIONS

Conceptualization: Samira Ben Belgacem.
Data curation: Samira Ben Belgacem.
Investigation: Samira Ben Belgacem, Wafa Ghardallou.

Methodology: Samira Ben Belgacem, Razan Alshebel.
Resources: Samira Ben Belgacem, Wafa Ghardallou, Razan Alshebel.
Software: Wafa Ghardallou, Razan Alshebel.
Supervision: Samira Ben Belgacem.
Validation: Samira Ben Belgacem, Razan Alshebel.
Visualization: Wafa Ghardallou.
Writing – original draft: Wafa Ghardallou, Razan Alshebel.
Writing – review & editing: Samira Ben Belgacem.

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