JPB REVIEW
INTERNATIONAL JOURNAL OF PROFESSIONAL BUSINESS REVIEW
ISSN: 2525-3654
OPEN ACCESS

FACTORS AFFECTING STOCK SELECTION AND MARKET TIMING ABILITY BETWEEN THE DEVELOPED COUNTRY AND EMERGING COUNTRIES IN ASEAN MARKETS

Tito Edwin Hasudungan Hutabarat[A], Poltak Sinaga[B], JohnTampil Purba[C], Anton Wachidin Widjaja[D]

ARTICLE INFO

Article history:

Received 24 March 2023

Accepted 19 June 2023

Keywords:

Equity;
Stock Selection Ability;
Net Asset Value;
Asean Countries.

ABSTRACT

Objective: This research is designed to propose empirical evidence on factors affecting stock selection ability and market timing ability.

Theoretical framework: Recent research found that most equity mutual funds underperform the market return due to a lack of stock selection and market timing abilities. However, rarely do they propose evidence of factors affecting the existence of these abilities

Method: There are two-panel regression models developed in this research to show evidence of factors affecting stock selection and market timing abilities. The Dumitrescu–Hurlin (DH) test is used to gain a comprehensive understanding of the causality relationship between the variables

Results and Conclusion: Based on observation of three ASEAN countries, this research proposes empirical evidence that the growth of fund size, volatility of the fund's net asset value (NAV), and performance indicators of the underlying assets affect the stock selection ability differently in the respective countries. Similarly, the growth of fund size, volatility of the fund's NAV, and macroeconomic indicators also affect the market timing ability differently

Implications of the research: Therefore, the implementation of investment strategies in the three observed markets considers factors affecting the existence of the two abilities, effectively generating outperforming returns.

Originality/value: Recent studies focused more on whether equity mutual funds are managed with stock selection and market timing abilities but not on factors affecting those abilities. This research proposes empirical evidence on factors affecting those abilities in different markets through econometrics analyses on panel data and the Dumitrescu–Hurlincausality test.

Doi: https://doi.org/10.26668/businessreview/2023.v8i6.1878

[A] *PhD in Corporate Finance. Pelita Harapan University. Tangerang, Banten, Indonesia.*
E-mail: th70015@student.uph.edu
[B] *Doctor in Financial Management. Professor. Pelita Harapan University. Tangerang, Banten, Indonesia.*
E-mail: poltak.sinaga@uph.edu
[C] *Doctoral of Management Department. Pelita Harapan University. Tangerang, Banten, Indonesia.*
E-mail: john.purba@uph.edu
[D] *Doctoral of Management Technology Program. Pelita Harapan University. Tangerang, Banten, Indonesia.*
E-mail: antonwachidinwidjaja@gmail.com

FATORES QUE AFETAM A SELEÇÃO DE AÇÕES E A CAPACIDADE DE MARKET TIMING ENTRE PAÍSES DESENVOLVIDOS E EMERGENTES NOS MERCADOS DA ASEAN

RESUMO
Objetivo: Esta pesquisa tem como objetivo propor evidências empíricas sobre os fatores que afetam a capacidade de seleção de ações e a capacidade de timing de mercado.
Estrutura teórica: Estudos recentes concluíram que a maioria dos fundos mútuos de ações tem desempenho inferior ao do mercado devido à falta de capacidade de seleção de ações e de market timing. Entretanto, eles raramente propõem evidências de fatores que afetam a existência dessas capacidades.
Método: Nesta pesquisa, foram desenvolvidos modelos de regressão de dois painéis para demonstrar os fatores que afetam as capacidades de seleção de ações e de market timing. O teste Dumitrescu-Hurlin (DH) é usado para obter uma compreensão abrangente da relação de causalidade entre as variáveis.
Resultados e conclusões: Com base na observação de três países da ASEAN, esta pesquisa propõe evidências empíricas de que o crescimento do tamanho do fundo, a volatilidade do valor do ativo líquido (NAV) do fundo e os indicadores de desempenho do ativo subjacente afetam a capacidade de seleção de ações de forma diferente nos respectivos países. Da mesma forma, o crescimento do tamanho do fundo, a volatilidade do valor patrimonial líquido (NAV) do fundo e os indicadores macroeconômicos também afetam a capacidade de market timing de forma diferente.
Implicações para a pesquisa: Portanto, a implementação de estratégias de investimento nos três mercados observados considera fatores que afetam a existência de ambas as habilidades, gerando efetivamente retornos superiores.
Originalidade/valor: Estudos recentes têm se concentrado mais em saber se os fundos mútuos de ações são administrados com habilidades de seleção de ações e de market timing, mas não nos fatores que afetam essas habilidades. Esta pesquisa propõe evidências empíricas sobre os fatores que afetam essas capacidades em diferentes mercados por meio de análise econométrica em dados de painel e teste de causalidade Dumitrescu-Hurlin.

Palavras-chave: Ações, Capacidade de Seleção de Ações, Valor do Ativo Líquido, Países da ASEAN.

FACTORES QUE AFECTAN A LA SELECCIÓN DE VALORES Y A LA CAPACIDAD DE MARKET TIMING EN LOS PAÍSES DESARROLLADOS Y EMERGENTES DE LOS MERCADOS DE LA ASEAN

RESUMEN
Objetivo: Esta investigación pretende proponer pruebas empíricas sobre los factores que afectan a la capacidad de selección de valores y a la capacidad de sincronización con el mercado.
Marco teórico: Estudios recientes han llegado a la conclusión de que la mayoría de los fondos de inversión de renta variable obtienen peores resultados que el mercado debido a la falta de capacidad de selección de valores y de market timing. Sin embargo, rara vez proponen pruebas de los factores que afectan a la existencia de estas capacidades.
Método: En esta investigación se desarrollaron modelos de regresión de dos paneles para demostrar los factores que afectan a las capacidades de selección de valores y de market timing. Se utiliza la prueba de Dumitrescu-Hurlin (DH) para obtener una comprensión exhaustiva de la relación de causalidad entre las variables.
Resultados y conclusiones: A partir de la observación de tres países de la ASEAN, esta investigación propone pruebas empíricas de que el crecimiento del tamaño de los fondos, la volatilidad del valor liquidativo (VL) de los fondos y los indicadores de rendimiento de los activos subyacentes afectan de manera diferente a la capacidad de selección de valores en los respectivos países. Del mismo modo, el crecimiento del tamaño de los fondos, la volatilidad del valor liquidativo de los fondos y los indicadores macroeconómicos también afectan de forma diferente a la capacidad de sincronización con el mercado.
Implicaciones para la investigación: Por lo tanto, la aplicación de estrategias de inversión en los tres mercados observados tiene en cuenta factores que afectan a la existencia de ambas habilidades, generando efectivamente rendimientos superiores.
Originalidad/valor: Los estudios recientes se han centrado más en si los fondos de inversión bursátiles se gestionan con habilidades de selección de valores y de market timing, pero no en los factores que afectan a estas habilidades. Esta investigación propone pruebas empíricas sobre los factores que afectan a estas habilidades en distintos mercados mediante un análisis econométrico sobre datos de panel y la prueba de causalidad de Dumitrescu-Hurlin.

Palabras clave: Acciones, Capacidad de Selección de Acciones, Valor Neto de los Activos, Países de la ASEAN.

INTRODUCTION

An investment strategy is essential in managing equity mutual funds to deal with the market condition, investment risk, and investors' needs (Lucas & Sanz, 2016; Rachmawati, Wahyudi, & Pangestuti, 2020). Therefore, it is crucial to determine the right investment strategy for an equity mutual fund. The well-known passive investment strategy approach was developed based on the invalid assumption that the market is efficient and the price reflects the available information, and, therefore, the future price is predictable (Maneli et al, 2022; Jeremias&Fatih, 2019; Zimon& Robert, 2020). Furthermore, this theory requires no involvement in trading activities and aims to generate a similar return to the market return (Birla, 2012; Glabadanidis, 2020). However, there is no such efficient market, and information available in the market might be limited or possessed by certain parties. The future price is not predictable due to market volatility, and the investment risk will not remain the same when a portfolio is established. Certain actions may be necessary to avoid investment loss to maximize the investment return at a particular time. Investors aim to optimize their returns because earning a return similar to the market return is no longer an option. By then, the investment fund manager will have sufficient ability to determine the right underlying assets in the portfolio (stock selection ability) and sufficient capability to select the proper action to deal with the market condition (market timing ability). This research proposes the enhancement of the passive investment strategy approach based on empirical evidence that market timing ability is also essential to passive investment strategy.

The other investment strategy is the active investment strategy. This strategy requires active trading, continuous market monitoring, and specific action at a particular time to outperform (Han & Hirshleifer, 2015; Sushko & Turner, 2018). During active trading, the investment fund manager decides whether to add or remove certain underlying assets from the portfolio at the right time(Salehi et al, 2022; Abdi et al, 2020). Therefore, they must have a strong in-stock selection and strong market timing capabilities. Furthermore, this strategy uses all available information and chooses a benchmark to exceed it by being involved in trading (Sushko & Turner, 2018). From a theoretical perspective, equity mutual funds will earn outperforming returns from strategy implementation (Dadashi, 2020; Mehta, Pothula, & Bhattacharyya, 2019; Rao-Nicholson & Svystunova, 2020).

The existence of approaches in both active and passive strategies is now questionable. Many studies have consistently found that most equity mutual funds failed to generate a return that beat the market return (Shokhnekh, Melnikova, & Gamayunova, 2019; Zhang & Chen,

2019). In a study in China, over 429 mutual funds in the Chinese market delivered similar results to studies in Germany and 27 other countries on the performance of equity mutual funds. They all found that the majority of the mutual funds in the market failed to beat the market return (Fahling, Steurer, & Sauer, 2019; Ferreira, Keswani, Miguel, & Ramos, 2013; Zhou & Wong, 2014).

Treynor & Mazuy (1966) proposed an evaluation model for mutual funds with two coefficients reflecting whether the fund manager could outguess the market return, generating an outperforming return. The two coefficients are coefficient alpha, which reflects stock selection ability, and coefficient gamma, which reflects market timing ability. These two indicators have been used in many studies to evaluate whether the mutual funds in the market outperform the market return (Ferreira & Carvalhal, 2017; Lailiyah & Setiawan, 2020). These two coefficients are essential for generating outperforming returns (Devi & Sudirman, 2021; Jian, Zayutdinova, & Zhang, 2021; Woltering, Weis, Schindler, & Sebastian, 2018). Recent studies mainly focus on the existence of these two abilities instead of questioning factors affecting their existence. Many studies have found that equity mutual funds were rarely managed with sufficient stock selection and market timing abilities (Agarwal & Pradhan, 2019; Fahling et al., 2019; Sherman, O'Sullivan, & Gao, 2017). Therefore, this research proposes empirical evidence of factors affecting the existence of these two abilities to improve the performance of the determined investment strategy.

This research is conducted in three ASEAN markets (Indonesia, Malaysia, and Singapore). The ASEAN market was the largest destination of foreign direct investment (FDI) because this region mostly consists of emerging countries that most countries need a lot of capital to develop (Chaisrisawatsuk, 2016). Two of the observed countries are emerging countries, and the remaining country is a developed country. This study compares factors affecting stock selection and market timing in developed countries with emerging countries to suggest the right approach to implementing the investment strategy to outperform in the respective markets.

LITERATURE REVIEW

Stock Selection and Market Timing Abilities

Treynor & Mazuy (1966) proposed a theoretical model for the performance evaluation of mutual funds. The model, as described below, is a quadratic model with the assumption that the mutual funds' performance is not in linear form. This model used two main indicators, stock

selection ability (α) and market timing ability (γ), to measure whether investment fund managers could outguess the market, hence generating outperforming returns.

$$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + \gamma_i(R_{mt} - R_{ft})^2 + \varepsilon p(t)$$

Where,

$R_{it} - R_{ft}$is the dependent variable representing an excess return, $(R_{mt} - R_{ft})$ is the market excess return, and the market's quadratic excess return$(R_{mt} - R_{ft})^2$. If coefficient α and coefficient $\gamma$are positive, the equity funds are managed with stock selection and market timing abilities. Therefore, the returns can outperform the market returns.

The above model has been considered by many studies of equity mutual funds, such as studies by Ferreira & Carvalhal (2017) and Hassan & Hussin (2018). In addition, many studies argued that the two abilities suggested by Treynor and Mazuy affect the generation of outperforming returns (Alsharif & Ahmad, 2021; Devi & Sudirman, 2021; Gusni, Silviana, & Hamdani, 2018; Jian et al., 2021; Woltering et al., 2018). However, most research found that very few equity mutual funds were managed with sufficient stock selection and market timing abilities (Agarwal & Pradhan, 2019; Chen, 2013; Fahling et al., 2019; Rijwani, 2014; Sherman et al., 2017; Zhou & Wong, 2014). Hence, very few equity mutual funds could generate outperforming returns.

The abovementioned research shows an urgency to identify factors affecting the existence of stock selection and market timing abilities. The investment managers can then continuously monitor these factors to maintain the significance of these two abilities; thus, the investment strategy will effectively generate outperforming returns.

Factors Affecting Stock Selection

Many researchers argue that stock selection ability is essential for achieving optimum performance. However, the majority of studies show that most equity mutual funds in the market were not managed with significant stock selection ability (Agarwal & Pradhan, 2019; Chen, 2013; Ferreira & Carvalhal, 2017; Sherman et al., 2017). Some factors may affect the existence of these two abilities. Thus, Otten & Bams (2002) and Tangjitprom (2014) suggested that the size of equity mutual funds affects their abilities. Similar arguments were put forward by Mahmood & Rubbaniy (2016) based on their observation of over 4,321 equity mutual funds in the USA from 1999 to 2012, andTangjitprom (2014) based on observations of performances

of mutual funds in Thailand from 2006 to 2012. They argued that the larger the fund size, the higher the return.

Stock selection ability means choosing the right underlying assets to be included in the portfolio and is essential to portfolio performance(Aouni, 2013; Fulga, Dedu, & Şerban, 2009). Graham (1974) and Lynch & Rothchild (1990) proposed selected criteria, such as the price-to-earnings ratio (P/E) ratio, dividend yield, and debt, to select the right underlying assets to build an adequate portfolio to generate returns. Recent studies argue that these criteria are still relevant to generating higher returns (Doblas, Enriquez, & Lagara, 2020; Kang, Kim, & Oh, 2019; Rachmattulah & Faturohman, 2016; Safitri, Mertha, Wirawati, & Dewi, 2020; Terzi, 2016; Ye, 2013).

Furthermore, another factor, suggested by Sharp (1963), is the relationship between the performance of the portfolio and the volatility of the fund's returns. The volatility of return performance can be determined using several measurements, such as mean, variance, covariance, and standard deviation. Sharp (1963) suggested continuously monitoring these parameters to manage the investment risk and fund performance.

Factors Affecting Market Timing Ability

Market monitoring is essential for the fund manager to determine the right action to deal with market changes. Macroeconomic indicators, such as inflation rate, interest rate, exchange rate, and gross domestic product (GDP), are indicators that may impact the reaction of the fund managers(Ferreira & Carvalhal, 2017). Furthermore, Jian et al. (2021) argued that macroeconomic indicators, such as dividend yield, corporate bond return performance, and performance of treasury bills, affect the market timing ability of the investment fund managers.

In addition, the size of equity mutual funds and their growth are argued to impact the market timing abilities (Tangjitprom, 2014). Jiang, Yao, & Yu (2007) observed 2,294 mutual funds in the USA from 1980 to 2002. They argued that the fund managers tend to have large fund sizes but small-cap stocks to take particular actions in managing the portfolio efficiently.

Sharp (1963) argued that the investment fund manager should monitor the standard deviation of funds' net asset value (NAV) to describe the fund's volatility. This indicator is more robust than the R-squared and is easier to understand (Moksony, 1999).

RESEARCH METHODOLOGY

Research Design

This research is designed to propose empirical evidence on factors affecting stock selection ability and market timing ability. There are two-panel regression models developed in this research to show evidence of factors affecting stock selection and market timing abilities. The Dumitrescu–Hurlin (DH) test is used to gain a comprehensive understanding of the causality relationship between the variables.

The stock selection ability (α) model

The panel regression model below was developed to propose empirical evidence of factors affecting stock selection ability in the observed countries by establishing four independent variables that hypothetically affect stock selection ability.

$$\alpha = d_0 + d_1 GFS + d_2 SDNAV_t + d_3 P/E_t + d_4 DY_t + \varepsilon_t$$

Where,

GFS is the growth of fund size, and SDNAV is the standard deviation of the fund's NAV (to measure the volatility of the fund price in the market), which is calculated by using this formula $SD = \sqrt{\sum_{i=1}^{n} \frac{(X_i - \bar{X})^2}{n-1}}$. P/E is the price-to-earnings ratio (monthly), and DY is the dividend yield.

The market timing ability (γ) model

The panel regression below was developed to propose empirical evidence of factors affecting market timing ability in the observed countries by establishing four independent variables: GFS (growth of the fund size), SDNAV (standard deviation of the fund's NAV), RM (market return), and GYLD (government bond yield from a 10-year bond).

$$\gamma = d_0 + d_1 GFS + d_2 SDNAV + d_3 RM + d_4 GYLD + \varepsilon_t$$

All data in this research are time-series data and the followings step were carried out to set the data stationarity. Therefore, the following exercise was conducted to ensure data readiness for model operationalization.

1. Calculate the discrepancies in the data series (Hyndman & Athanasopoulos, 2018)for several variables (market return, growth of fund size, growth of government bond yield).

2. Utilize the Durbin–Wu–Hausman (DWH) test to detect whether endogenous regressors (predictor variables) exist and determine whether the regression model operates with random effects or fixed effects.

3. Perform the augmented Dickey-Fuller (ADF) test to ensure the variable does not contain a unit root and cointegration test.

Furthermore, the Dumitrescu–Hurlin (DH) test was conducted to determine causality between the variables in the panel regression models:

$$Y_{i,t} = \alpha_i + \sum_{k=1}^{K} Y_i^k Y_{i,t-k} + \sum_{k=1}^{K} B_i^k X_{i,t-k} + \varepsilon_{i,t}$$

Where,

X and Y refer to the variables whose causality is analyzed in two ways, and K is the optimum interval lag (lag interval 1 was used).
R software was used for the models' operationalization as it is effective for conducting analyses on big data (Patil, 2016).

Scope

This research randomly selected 26 equity mutual funds from Indonesia, Malaysia and Singapore and analyzed their performance during the period from January 1, 2015, to December 31, 2020. These countries represent major economies of emerging and developed markets in the region.

Data Collection

This research used secondary data obtained from credible sources such as the Bloomberg database and bank websites. The rate of market return is calculated by using the growth of the ASEAN index, which is generated from the ASEAN market website. As the purpose of this research is purely to enhance the existing theories of investment strategies, the identity of the 26 samples will not be disclosed.

ANALYSIS AND RESULTS

Stock Selection Ability (α)

Data stationarity and model validity

The differencing methodology is conducted on two independent variables: market return (RM) and growth of the fund size (GFS). The stationarity testing of all data is conducted through ADF and DWH tests. The ADF test resulted in a negative test score for all groups of panel data, meaning that there is no unit root. Therefore, the data is in stationary form. The goodness of fit and robustness tests were used to validate the models. The result shows the R^2 is within the range of 0.0012–0.1075, which means there is a causal relationship between the independent variables and the dependent variable. The model does not provide a complete list of the phenomena(Moksony, 1999). Furthermore, data cointegration does exist in this model, which is shown by the p-value (refer to Table 1). The regression model is conducted by random effects from the DWH test; the p-values of all data groups are more significant than the alpha (5%/10%) (refer to Table 2).

Table 1. ADF test.

Region/Country	Model Alpha	
	ADF test	p-value
Indonesia	-11.114	0.010
Malaysia	-9.9212	0.010
Singapore	-7.6368	0.010

Source: Author's data processing, 2022

Table 2.DWH test.

DWH Test	
Region/Country	Model for Stock Selection Ability (α)
Indonesia	1.000
Malaysia	0.990
Singapore	0.060

Source: Author's data processing, 2022

Descriptive discussion

This section discusses the results of the panel regression model for stock selection ability (α) and another test to withdraw the conclusion from empirical analyses.

1. Indonesia

The results of the panel regression model are shown below:

$$\alpha = -1.5541.e-04-6.45E-05GFS-2.21E-03SDNAV-1.78E\ PE+00-1.27E-05DY+0.011788$$

As shown in Table 3, the regression result of the coefficient of R^2 is 0.0117, and the RSME is very low (0.0015). This result means that all variables affect stock selection ability. The model is effective in evaluating the stock selection ability of the fund manager in managing the equity mutual fund to generate outperforming returns through the determined investment strategy. How all independent variables affect the stock selection ability is explained as follows:

- An increment of one GFS unit will reduce the significance of α by 6.54e-05 and vice versa, probably because the larger the fund size, the lower the flexibility of the fund manager in selecting the right equities in the portfolio. One reason behind the growth of the fund size may be an increase in demand for the fund. This is viewed as an opportunity to enhance the equity fund's performance. Therefore, the investment fund manager will either identify more equities to include in the portfolio or change the components (weight) of existing underlying assets to manage the investment risk and generate a higher, outperforming return. This can be done by the establishment of criteria for stock selection based on strong empirical analyses to decide on equities which will strengthen the return performance of the equity mutual fund.
- An increment of one SDNAV unit will reduce the significance of α by 2.21e-03 and vice versa. This is probably because of the larger changes in the fund's NAV and the lesser aggressiveness of the fund manager. In this example, if the fund's NAV decreases by a certain percentage, the fund manager may carefully take action (or not take any action) against the equity mutual fund. Instead of evaluating the reason behind the decrement, i.e., by analyzing the performance of the underlying assets to identify which equities are dragging down the fund's NAV, the fund manager may choose not to replace them with new equities to take (immediate) action. Suppose they take action by removing the underlying assets, which causes a decrement of the fund's NAV, in that case, they may not only avoid losses, but they may generate a positive return, even an outperforming return. Furthermore, if the fund's NAV increases by a certain percentage, it will not decrease the stock selection ability of the fund manager. Instead, they will continuously monitor and analyze all potential factors to take immediate action if required, i.e., add more equities to the portfolio or change the portfolio structure to generate an outperforming return.
- An increment of one unit in the performance of underlying assets will reduce the stock selection ability of the fund manager; an increment of one P/E unit will decrease α by 1.78e+00, and an increment of one DY unit will decrease α by 1.27e.05, and vice

versa. This result indicates that any increment in the performance of underlying assets will decrease the stock selection ability of the fund manager. Only if there is a decrement in performance will they take action by replacing the non-performing underlying assets with well-performing underlying assets. If the performance of the underlying assets is increased, instead of not taking any action, the investment fund manager should monitor and analyze all underlying assets' performance by using the price-to-earnings ratio (P/E) and the dividend yield(DY). Then, they should replace assets with the lowest P/E and DY with new equities or increase the weight of the equities in the portfolio with a high P/E and DY. This is supposedly done to enhance the performance of the equity mutual fund to generate an outperforming return.

Table 3. Descriptive panel data for Indonesia.

Descriptive Statistics				
Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
GFS	-6.49E-05	7.46E-02	-9.00E-04	0.99
SDNAV	-2.21E-03	5.63E+00	-4.00E-04	0.99
P/E	-1.78E+00	5.61E-04	-3.00E-04	0.99
DY	-1.27E-05	5.01E-02	-3.00E-04	0.99
RSME	0.01			
R^2	0.01			
DF	4.00			

Source: Author's data processing, 2022

Based on the DH causality test from the independent variables to the dependent variable, three variables (GFS, P/E, DY) have causality with stock selection ability (α) shown by the z-tilde of these variables (1.88, 4.74, 2.42), which are larger than the z-table for 5% (1.96) or 10% alpha (1.65). The p-values of these three variables are smaller than the alpha; only the SDNAV variable has an undefined causality with stock selection ability (α). Based on the DH test from the dependent to the independent variables, stock selection ability (α) has causality with the growth of the fund size (GFS) and undefined causality with the other three variables(see Table 4).

From this result, it can be interpreted that any GFS, P/E, and DY changes will affect the investment fund manager's stock selection ability (α). This result is similar to the descriptive result that all of these variables affect stock selection ability. Therefore, the investment fund manager should continuously monitor and manage all of these variables, especially the growth of the fund size performance of the underlying assets (P/E and DY). Changes in these variables should not weaken the investment fund manager's stock selection ability. Instead, they should maintain a strong stock selection ability by deciding what equities should be removed and

replaced with new equities, changing the portfolio structure, enhancing the equity mutual fund's performance, and generating outperforming returns. This action may grow the size of the equity mutual fund as there may be more demand for the fund based on its excellent performance. This will create a more active and attractive capital market.

Table 4. Causality test for Indonesia.

DH Test for Indonesia			
Model - Stock Selection Ability (α)	**p-value (lag 1)**	**z-tilde**	**Conclusion**
A. Independent to Dependent (α)			
GFS --> α	0.06	1.88	GFS causality with α
SDNAV --> α	0.33	0.97	Undefined causality
P/E --> α	0.00	4.74	P/E causality with α
DY --> α	0.02	2.24	DY causality with α
B. Dependent (α) to Independent			
α --> GFS	2.20E-16	18.34	α causality with GFS
α --> SDNAV	0.26	-1.12	Undefined causality with SDNAV
α --> P/E	0.57	0.56	Undefined causality with P/E
α --> DY	0.66	-0.43	Undefined causality with DY

Source: Author's data processing, 2022

2. Malaysia

The results of the panel regression model are shown below:

$$\alpha = 1.2827e-04 - 2.89e-03GFS - 1.03e-02SDNAV - 2.20e-07PE + 6.22e-05DY + 0.00245$$

From the regression result, as shown in Table 5 below, the coefficient of R^2 is 0.0012, and the RSME is very low (0.0025). This result means that all variables affect stock selection ability. The model is good to use to evaluate the stock selection ability of the fund manager in managing the equity mutual fund to generate an outperforming return through the determined investment strategy. How all independent variables affect the stock-selection ability is explained as follows:

- An increment of one GFS unit will reduce the significance of α by 2.89e-03 and vice versa. This is because the larger the fund size, the lower the flexibility of the fund manager in selecting the right equities in the portfolio. An increment in demand for the fund might be one reason behind the growth of the fund size. This is viewed as an opportunity to enhance the equity fund's performance. Therefore, the investment fund manager should either identify more equities in the portfolio or change the components (weight) of the existing underlying assets to manage the investment risk and generate a higher, or outperforming, return. They can establish criteria for stock selection based on

strong empirical analyses to decide which equities will strengthen the return performance of the equity mutual fund.

- An increment of one SDNAV unit will reduce the significance of α by 1.03e-02 and vice versa. This is probably because of the larger changes in the fund's NAV and the lesser aggressiveness of the fund manager. In this example, if the fund's NAV decreases by a certain percentage, the fund manager may carefully take action (or not take any action) against the equity mutual fund. Instead of evaluating the reason behind the decrement, i.e., by analyzing the performance of the underlying assets to identify which equities are dragging down the fund's NAV, the fund manager may choose not to replace them with new equities. If they remove the underlying assets, causing a decrement of the fund's NAV, they may not only avoid losses, but they may generate a positive return, even an outperforming return. Furthermore, if the fund's NAV increases by a certain percentage, it will not decrease the stock selection ability of the fund manager. Instead, they should continuously monitor and analyze all potential factors and act if required, i.e., add more equities to the portfolio or change the portfolio structure to generate an outperforming return.
- An increment of one unit in the performance of the underlying assets will reduce the stock selection ability of the fund manager; an increment of one P/E unit will decrease α by 2.20e-07, and an increment of one DY unit will increase α by 6.22e-e.05 and vice versa. This result implies that an increment in the underlying asset's performance will affect the changes in the stock selection ability (α) of the investment fund manager. If the performance of the underlying assets is increased, instead of not taking any action, the investment fund manager should monitor and analyze all underlying assets' performance based on P/E and DY. Then, they should replace assets with the lowest P/E and DY with new equities or increase the weight of the equities in the portfolio with a high P/E and DY.

Table 5.Descriptive panel data for Malaysia.

Descriptive Statistics				
Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
GFS	-2.89E-03	2.95E-03	-0.98	0.32
SDNAV	-1.03E-02	5.64E-03	-1.84	0.06
P/E	-2.20E-07	3.57E-06	-0.06	0.95
DY	6.22E-05	1.25E-04	0.49	0.61
RSME	0.00			
R^2	0.01			
DF	4.00			

Source: Author's data processing, 2022

Based on the Dumitrescu–Hurlin (DH) causality test from the independent variables to the dependent variable, there is one variable (DY) that has causality with the stock selection ability (α) shown by the z-tilde (1.95), which is larger than the z-table for the 10% alpha (1.65). Its p-value is lower than the 5% or 10% alpha. Furthermore, from the DH test of the dependent variable to the independent variables, the dependent variable has a causality relationship with two independent variables (GFS and P/E). The z-tilde with GFS (12.55) and with P/E (4.75) are larger than the z-table for 5% (1.96) and/or 10% (1.64) alpha. The p-values of these two variables (2.20E-16 and 2.0173-06) are also lower than the 5% or 10% alphas(see Table 6).

From this result, it is interpreted that changes in the DY will affect the stock selection ability (α) of the investment fund manager. This result is similar to the descriptive result that all independent variables affect the stock selection ability. Therefore, the investment fund manager should continuously monitor all of these variables, especially the performance of the underlying assets. A change will not weaken the stock selection ability of the investment fund manager (α). Instead, they should maintain a strong stock selection ability by deciding what equities should be removed and replaced with new equities, change the portfolio structure, enhance the equity mutual fund's performance, and generate outperforming returns. These actions may grow the size of the equity mutual fund as there might be more demand for the fund due to its favourable performance. Furthermore, their action in managing the underlying assets may impact the price to earnings of the equities' underlying assets. This will create a more active and attractive capital market.

Table 6.Causality test for Malaysia.

DH Test for Malaysia			
Model - Stock Selection Ability (α)	**p-value (lag 1)**	**z-tilde**	**Conclusion**
A. Independent to Dependent (α)			
GFS --> α	0.33	-0.95	Undefined causality
SDNAV --> α	0.12	-1.54	Undefined causality
P/E --> α	0.77	-0.29	Undefined causality
DY --> α	0.05	1.95	DY causality with α
B. Dependent (α) to Independent			
α --> GFS	2.20E-16	12.55	α causality with GFS
α --> SDNAV	0.33	-0.96	Undefined causality
α --> P/E	0.00	4.75	α causality with P/E
α --> DY	0.10	-1.63	Undefined causality

Source: Author's data processing, 2022

3. Singapore

The results of the panel regression model are shown below:

$$\alpha = 5.0988e-04 - 0.002033GFS + 0.000148SDNAV - 0.000012PE - 0.000171DY + 0.000512292$$

From the regression result, as shown the Table 7, the coefficient of R^2 is 0.107, and the RSME is very low (0.00051). This result means that all variables affect stock selection ability. The model is good to use to evaluate the stock selection ability of the fund manager in managing the equity mutual fund to generate outperforming returns through the determined investment strategy. How all independent variables affect the stockselection ability is explained as follows:

- An increment of one GFS unit will reduce the significance of α by 0.002033 and vice versa. This is because the larger the fund size, the lower the flexibility of the fund manager in selecting the right equities in the portfolio. One reason behind the fund size growth may be an increase in demand for the fund. This is viewed as an opportunity to enhance the equity fund's performance. Therefore, the investment fund manager should either identify more equities to include in the portfolio or change the components (weight) of the existing underlying assets to manage the investment risk and generate a higher return, or an outperforming return. This can be done by establishing the criteria for stock selection based on strong empirical analyses to select equities that will strengthen the return performance of the equity mutual fund.
- An increment of one SDNAV unit will improve the significance of α by 0.000148 and vice versa. Different from the results for Indonesia and Malaysia, a larger change in a fund's NAV in Singapore will increase the aggressiveness of the fund manager. Fund managers in Singapore may optimize returns by analyzing the performance of the underlying assets to identify which equities are dragging down the funds' NAV. If they take action by removing the underlying assets, this will cause a decrement in the fund's NAV. In that case, they may not only avoid losses, but they may generate a positive return, even an outperforming return. Furthermore, if the fund's NAV increases by a certain percentage, it will not decrease the stock selection ability of the fund manager. Instead, they should continuously monitor and analyze all potential factors and take immediate action if it is necessary, i.e., by adding more equities to the portfolio or changing the portfolio structure to generate an outperforming return.
- An increment of one unit in the performance of the underlying assets will reduce the stock selection ability of the fund manager. An increment of one unit of P/E will decrease α by 0.000012 units, and an increment of one DY unit will reduce α by

0.00017, and vice versa. This means that any increment in the underlying asset's performance will decrease the stock selection ability of the fund manager. Only if there is a decrement in the performance of the underlying assets will they take action by replacing the non-performing underlying assets with well-performing underlying assets. If the performance of the underlying assets is increased, instead of not taking any action, the investment fund manager should monitor and analyze all underlying assets' performance by using the P/E and DY. Then, the lowest P/E and DY should be replaced with new equities or the weight of the equities in the portfolio should be increased with a high P/E and DY.

Table 7.Descriptive panel data for Singapore.

Descriptive Statistics				
Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
GFS	(0.01)	1.51E-03	-1.34	0.17
SDNAV	0.01	5.32E-05	2.78	0.00
P/E	(0.01)	5.15E-06	-2.33	0.01
DY	(0.01)	6.34E-05	-2.70	0.01
RSME	0.01			
R^2	0.10			
DF	4.00			

Source: Author's data processing, 2022

Based on the result of the causality DH test from the independent variables to the dependent variable, there is an undefined causality relationship between all independent variables to the dependent variable for the Z-tilde of all variables (-0.71, -1.02, -0.73, 0.29), which are lower than the Z-table of 5% (1.96) and 10% (1.65) alphas. Similar to the Z-tilde, the p-value of each variable is also higher than the 5% and 10% alphas. Though the DH test found an undefined causality relationship, the econometric results of the panel regression model, as previously discussed, show that all of these independent variables affect stock selection ability (α). This means that changes in these variables may affect the significance of the fund managers' stock selection ability (α). In addition, from the causality test of the dependent variable to independent variables, the stock selection ability (α) has a causal relationship with the GFS as the z-tilde (3.26) is larger than the z-table of 5% (1.96) and 10% (1.64) alphas, and its p-value (0.001) is also smaller than the 5% and 10% alphas (see table 8).

Investment fund managers should continuously monitor all of these variables, but any changes should not weaken the abilities of the fund managers (α). Instead, they should maintain strong stock selection ability by deciding what equities should be removed and replaced with new equities, change the portfolio structure, enhance the equity mutual fund's performance, and

generate outperforming returns. These actions may grow the size of the equity mutual fund as there might be more demand for the fund due to its good performance. Furthermore, their action in managing the underlying assets may impact the price to earnings of the equities' underlying assets. This will create a more active and attractive capital market.

Table 8. Causality test for Singapore.

DH Test for Singapore			
Model 3 - Stock Selection Ability (α)	**p-value (lag 1)**	**z-tilde**	**Conclusion**
A. Independent to Dependent (α)			
GFS --> α	0.47	-0.71	Undefined causality
SDNAV --> α	0.30	-1.02	Undefined causality
P/E --> α	0.46	-0.73	Undefined causality
DY --> α	0.77	0.29	Undefined causality
B. Dependent (α) to Independent			
α --> GFS	0.01	3.26	α causality with GFS
α --> SDNAV	0.33	0.95	Undefined causality
α --> P/E	0.52	-0.63	Undefined causality
α --> DY	0.33	0.95	Undefined causality

Source: Author's data processing, 2022

Market Timing Ability (γ)

Data stationarity and model validity

The differencing methodology was conducted on two independent variables: RM and GFS. The stationarity testing of all data was conducted through the ADF and DWH tests, and a negative DF test score was found for all groups of panel data. Therefore, there is no unit root identified; hence, the data is in stationary form. The goodness of fit and robustness tests were used to validate the models. The results show that the R^2 is within the range of 0.0033 – 0.0085, which means there is a causal relationship between the independent variables with the dependent variable. Furthermore, data cointegration was found to exist in this model, which is shown by the p-value in Table 9. The regression model was conducted by random effects as per the DWH test, and the p-values of all data groups are more significant than the 5% and 10% alphas (see Table 10).

Table 9. ADF test.

Region/Country	**Model Gamma**		**Conclusion**
	ADF Test	**p-value**	
Indonesia	-8.87	0.01	Stationary
Malaysia	-8.99	0.01	
Singapore	-7.14	0.01	

Source: Author's data processing, 2022

Table 10.DH test.

DWH Test	
Region/Country	**Model Market Timing Ability (Y)**
ASEAN	0.79
Indonesia	0.76
Malaysia	0.57
Singapore	0.73

Source: Author's data processing, 2022

Descriptive discussion

This section discusses the results of the panel regression model of market timing ability (γ) and a further test to conclude from the empirical analyses.

4. Indonesia

The panel regression model of market timing ability in Indonesia is shown below:

$$\gamma = -11.524 + 2.79687GFS - 1246.0505SDNAV - 230.287RM - 230.023GYLD + 275.3285$$

From the regression results as shown in Table 11, the coefficient of R^2 is 0.0033 and the p-values for all variables are 2.20e-16. Though the RMSE is very large (275.32), the cointegration test results indicate that all independent variables in this model are cointegrated with the market timing ability as the p-value of 0.761 is more significant than the 5% or 10% alpha. Therefore, it is concluded that all independent variables affect the market timing ability (γ) of the investment fund manager.

- An increment of one GFS unit will improve the significance of market timing ability (γ) by 2.79 units and vice versa. Therefore, it is essential for the investment fund manager to continuously monitor the market to grow the fund size and take action at the right time to deal with the market condition, minimize loss, or maximize returns by generating outperforming returns.
- An increment of one SDNAV unit will reduce the market timing ability (γ) of the fund manager by 1246.05 units and vice versa. This result shows that the larger the change in the fund's NAV, the more careful the fund manager is regarding taking action. A larger change in the fund's NAV will result in more analyses carried out by the investment manager to identify the root cause of this significant change. Hence, they can make effective decisions at the right time to manage the investment risk and optimize the opportunity to generate an outperforming return.

- An increment of one unit of the macroeconomic variable will decrease the market timing ability (γ) of the fund manager and vice versa. From the regression coefficient, an increment of one unit in the market return will decrease the market timing ability (γ) by 230.28 units. An increment of one unit in the yield of a government bond will decrease the market timing ability of the investment fund manager by 230 units. It is therefore suggested that the investment manager should take action when the macroeconomic variable shows an increment to generate an outperforming return. A positive increment in the macroeconomic variable signals an opportunity to generate more return that must be utilized instead of taking no action.

Table 11.Descriptive results for Indonesia.

Country	**Descriptive Statistics**				
	Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
Indonesia	GFS	2.79	0.07	37.7	2.20E-16
	SDNAV	-1246	5.31	-234	0.00
	RM	-230	2.67	-86.0	0.00
	GYLD	-230	2.95	-78.0	0.00
	RSME	275			
	R-sq	0.01			
	DF	4.00			
	P-value	0.00	p-value < alpha (0.05, 0.1)		

Source: Author's data processing, 2022

Based on the Dumitrescu–Hurlin (DH) causality test shown in Table 12fromthe independent variables to the dependent variable, SDNAV and RM have causality with the market timing ability (γ). The z-tilde of these variables, respectively, are |2.17| and |1.79|, or larger than the z-table for the 5% alpha (1.96) or the 10% alpha (1.65). The p-values of these variables are also lower than the 5% or 10% alphas (0.02 and 0.01). In addition, based on the DH test for the dependent variable to the independent variables, market timing ability has a causal relationship with two independent variables (GFS, GYLD) as the Z-tildes (25.07 and 2.59) are larger than the Z-table for the 5% (1.96) or 10% (1.65) alphas. Furthermore, the p-values (2.20E-16, and 0.009) are also lower than the 5% and 10% alphas. Based on this result, changes in the SDNAV and RM will trigger the investment fund manager to act at the right time. They do this to manage the investment risk or maximize portfolio returns. This action may trigger the growth of the fund size as one of their strategies to generate more returns. In addition, their action to maximize the return by adding more assets to the portfolio and growing the portfolio size may become an incentive for the government to increase the yield of the

government bond; hence this instrument will be considered by the investment manager to be included in the portfolio.

Table 12.Causality test for Indonesia.

Causality Test (DH Test) - Indonesia			
Model - Market Timing Ability (β)	**z-tilde**	**p-value (lag 1)**	**Conclusion**
A. Independent to Dependent (α)			
GFS -->γ	1.52	0.12	Undefined causality
SDNAV -->γ	-2.17	0.02	SDNAV causality with γ
RM -->γ	-2.34	0.02	RM causality with γ
GYLD -->γ	-1.79	0.07	GYLD causality with γ
B. Dependent (α) to Independent			
γ --> GFS	25.07	0.00	γ causality with GFS
γ --> SDNAV	-0.86	0.38	Undefined causality
γ --> RM	0.05	0.96	Undefined causality
γ --> GYLD	2.59	0.01	γ causality with GYLD

Source: Author's data processing, 2022

5. Malaysia

The panel regression model for Malaysia is shown below:

$$\gamma = 92.769 - 531.686GFS - 1987.718SDNAV - 634.184RM - 1267.838GYLD + 719.3624$$

From the regression results shown in Table 13, the coefficient of R^2 is 0.008. Though the RMSE is very large (719.36), the cointegration test results indicate that all independent variables in this model are cointegrated with the market timing ability as the p-value of 0.576 is more significant than the 5% or 10% alphas. Therefore, it is concluded that all independent variables affect the market timing ability (γ) of the investment fund manager.

- An increment of one GFS unit will reduce the significance of the market timing ability (γ) by 531.68 units and vice versa. This result shows that in Malaysia if the size of the fund increases, the investment fund manager may be more careful to take action when there are changes in the market condition. When the size of the fund grows, the investment risk may also change. Therefore, to generate a positive return and outperform the market return, the investment fund manager should take the appropriate action to maximize the return from the growing fund.
- An increment of one SDNAV unit will reduce the market timing ability (γ) of the fund manager by 1987.71 units and vice versa. This result shows that the larger the change in the fund's NAV, the more careful the fund manager is to take action. A larger

change in the fund's NAV means that more analyses will be carried out by the investment manager to identify the root cause of this large change. Hence, they can make effective decisions at the right time to manage the investment risk and optimize the opportunity to generate an outperforming return.

- An increment of one unit in the macroeconomic variable will decrease the market timing ability (γ) of the fund manager and vice versa. From the regression coefficient, an increment of one8 RM units will decrease the market timing ability (γ) by 634.18 units. An increment of one unit of the yield of a government bond will reduce the market timing ability of the investment fund manager by 1267.82 units. It is therefore suggested that the investment manager take action when the macroeconomic variable increases to generate more returns. The increment in the macroeconomic variable signals an opportunity to generate more returns that must be utilized at the right time.

Based on the Dumitrescu–Hurlin (DH) causality test shown in Table 14 for the independent variables to the dependent variable, GFS and GYLD have causality with the market timing ability. The z-tildes of GFS (|1.94|) and GYLD (|1.97|) are larger than the Z-table for the 5% alpha (1.96) or 10% alpha (1.64). In addition, the p-values of these variables (0.05, and 0.048) are lower than the 5% and 10% alphas. The DH test of the dependent variable to the independent variables shows that market timing ability (γ) has a causal relationship with three independent variables (GFS, SDNAV, GYLD) as the Z-tildes (1.72, 4.39, and 2.09) are larger than the Z-table for the 5% (1.96) and/or 10% (1.65) alphas. Furthermore, the p-values (0.09, 1.120E-05, and 0.03) are also lower than the 5% and/or 10% alphas. In addition, from this causality test, GYLD has a bi-directional causal relationship with the market timing ability (γ).

Table 13.Descriptive panel data for Malaysia.

Country	**Descriptive Statistics**				
	Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
Malaysia	GFS	-531	862	-0.61	0.53
	SDNAV	-1987	1405	-1.41	0.15
	RM	-634	619	-1.02	0.30
	GYLD	-1267	607	-2.08	0.03
	RSME	7192			
	R^2	0.01			
	DF	4.00			
	P-value	0.18	p-value > alpha (0.05, 0.1)		

Source: Author's data processing, 2022

Based on this result, changes in the GFS and GYLD will trigger the investment fund manager to take action at the right time. They do this to manage the investment risk, avoid losses, or maximize portfolio returns. The increment in government bond yield may signal that the government is working on monetary policy. This is good, as the capital market may also respond to government action. Therefore, taking action may be important to generate more returns from the equity mutual funds. Vice versa, active trading may provide more incentive to the government to improve its bond's yield to attract the fund manager's interest to purchase the government bond for their portfolio. In addition, the market timing ability of the fund manager may help them to grow the fund size to gain more profit. This action may then change the fund's NAV and generate more outperforming returns.

Table 14.Causality test for Malaysia.

Causality Test (DH Test) - Malaysia			
Model 4 - Market Timing Ability (β)	**p-value (lag 1)**	**z-tilde**	**Conclusion**
A. Independent to Dependent (α)			
GFS -->γ	0.05	-1.94	GFS causality with γ
SDNAV -->γ	0.90	0.12	Undefined causality
RM -->γ	0.11	-1.57	Undefined causality
GYLD -->γ	0.05	-1.97	GYLD causality with γ
B. Dependent (α) to Independent			
γ --> GFS	0.09	-1.72	γ causality with GFS
γ --> SDNAV	1.12E-05	4.39	γ causality with SDNAV
γ --> RM	0.11	1.56	Undefined causality
γ --> GYLD	0.03	-2.09	γ causality with GYLD

Source: Author's data processing, 2022

6. Singapore

The panel regression model for Singapore is shown below:

$$\gamma = -36.1362 - 9.21GFS - 11.73SDNAV - 269.96RM - 346.61GYLD + 490.6316$$

From the regression result, as shown in Table 15 below, the coefficient of R^2 is 0.0033. Though the RMSE is very large (719.36), the cointegration test result indicates that all independent variables in this model are cointegrated with the market timing ability as the p-value of 0.7297 is more significant than the 5% or 10% alphas. Therefore, it is concluded that all independent variables affect the market timing ability (γ) of the investment fund manager.

- An increment of one GFS unit will reduce the significance of the market timing ability (γ) by 9.21 units and vice versa. From this result, if the size of the fund is getting bigger, the investment fund manager may be more careful to take action when there are

changes to the market condition. When the fund size grows, the investment risk may also change. Therefore, to generate a positive return and outperform the market return, the investment fund manager should take action to maximize the return from the growing fund.

- An increment of one SDNAV unit will reduce the market timing ability (γ) of the fund manager by 11.73 units and vice versa. This result shows that the larger the change in the fund's NAV, the more careful the fund manager is to take action. The larger the change in the fund's NAV, the more analyses will be carried out by the investment manager to identify the root cause of this large change. Hence, they can make an effective decision at the right time to manage the investment risk and optimize the opportunity to generate an outperforming return.
- An increment of one unit in the macroeconomic variable will decrease the market timing ability (γ) of the fund manager and vice versa. From the regression coefficient, an increment in one RM unit will decrease the market timing ability (γ) by 268.96 units. An increment of one unit in the yield of a government bond will reduce the market timing ability of the investment fund manager by 346.61 units. It is suggested that the investment manager take action when these macroeconomic variables show an increase to generate more return. An increase in the macroeconomic variable signals an opportunity to generate more returns that must be utilized at the right time.

Table 15.Descriptive results for Singapore panel data.

Country	**Descriptive Statistics**				
	Independent Variable	**Coefficient**	**Std. Error**	**z**	**P>|z|**
Singapore	GFS	(9.21)	0.07	(128)	2.20E-16
	SDNAV	(11.7)	0.05	(236)	2.20E-16
	RM	(269)	0.71	(376)	2.20E-16
	GYLD	(346)	0.52	(665)	2.20E-16
	RSME	490			
	R^2	0.01			
	DF	4.00			
	P-value	2.22E-16	p-value < alpha (0.05, 0.1)		

Source: Author's data processing, 2022

Based on the Dumitrescu–Hurlin (DH) causality test shown in Table 16 for the independent variables to the dependent variable, RM and GYLD have causality with the market timing ability. This causality is shown by the z-tildes of RM (|2.71|) and GYLD (|2.87|), which are more significant than the Z-table for the 5% alpha (1.96) or 10% alpha (1.64). Furthermore, the p-values of these variables (0.007 and 0.004) are lower than the 5% or 10% alphas. In

addition, the DH test of the dependent variable to the independent variables showed that market timing ability has an undefined causality relationship with all independent variables as the z-tilde coefficients are lower than the z-table for the 5% or 10% alphas. The p-values are more significant than the 5% or 10% alphas. Based on this result, changes in the RM and GYLD will trigger the investment fund manager to take action at the right time. They do this to manage the investment risk, avoid losses, or maximize portfolio returns as the macroeconomic variable signals positive growth. Taking action now may be essential to generate more returns from the equity mutual funds.

Table 16.Causality test for Singapore.

Causality Test (DH Test) - Singapore			
Model 4 - Market Timing Ability (β)	**p-value (lag 1)**	**z-tilde**	**Conclusion**
A. Independent to Dependent (α)			
GFS -->γ	0.58	-0.54	Undefined causality
SDNAV -->γ	0.43	-0.77	Undefined causality
RM -->γ	0.01	-2.71	RM causality with β
GYLD -->γ	0.01	-2.87	GYLD causality with β
B. Dependent (α) to Independent			
γ --> GFS	0.51	-0.65	Undefined causality
γ --> SDNAV	0.27	1.09	Undefined causality
γ --> RM	0.89	0.12	Undefined causality
γ --> GYLD	0.39	0.84	Undefined causality

Source: Author's data processing, 2022

CONCLUSIONS

This research proposes empirical evidence that all independent variables used in the respective model affect investment fund managers' stock selection and market timing abilities. Therefore, the investment fund managers should manage their response to the changes in these variables to control stock selection and market timing. They can use the models developed in this research to continuously evaluate their stock selection and market timing abilities. To manage their stock selection and market timing abilities, they can add more relevant independent variables depending on the market circumstances. Therefore, they can work to generate outperforming returns.

Furthermore, this research suggests that these two abilities be embedded in both active and passive investment strategies. Hence, both strategies can be used by investment managers to generate outperforming returns.

The limitation of this research is that it did not obtain data on all underlying assets of the observed equity mutual funds. This is probably why the residual error in one of the models

is extremely high. Therefore, the researchers recommend that future studies use data from sources that can provide the full details of the equity mutual funds.

CONTRIBUTION

Recent studies focused more on whether equity mutual funds are managed with stock selection and market timing abilities but not on factors affecting those abilities. This research proposes empirical evidence on factors affecting those abilities in different markets through econometrics analyses on panel data and the Dumitrescu–Hurlincausality test.

REFERENCES

Abdi, Yaghoub, Xiaoni Li, and Xavier Càmara-Turull.(2020). Impact of Sustainability on Firm Value and Financial Performance in the Air Transport Industry.Sustainability 12: 9957

Agarwal, P., & Pradhan, H. (2019). Mutual fund performance in changing economic condition: Evidence from an emerging economy. *Cogent Economics & Finance, 7*(1), 1-24.

Alsharif, D., & Ahmad, S. (2021). Performance evaluation: Islamic mutual funds Vs. Conventional mutual funds in Saudi Arabia. *Palarch's Journal of Archaeology of Egypt/Egyptology, 18*(13), 899-909.

Aouni, B. C. (2013). Financial portfolio management through the goal programming model: Current state-of-the-art. *European Journal of Operational Research, 234*(2), 536-545.

Birla, R. (2012). *Determinant of the success of active vs. Passive Investment Strategy*: University of Albany: Business/Business Administration.

Chaisrisawatsuk, S. (2016). Capital market development in ASEAN economic community: Issues and opportunities for other subregions of the Asia-pacific region (pp. 4). Bangkok, Thailand: ESCAP.

Chen, D.-H. (2013). Market timing and stock selection ability of mutual fund managers in Taiwan: Applying the traditional and conditional approaches. *International Research Journal of Finance and Economics, 4*(1), 75-98.

Dadashi, H. (2020). Optimal investment strategy post retirement without ruin possibility: A numerical algorithm. *Journal of Computational and Applied Mathematics, 363*, 325-336.Available at: https://doi.org/10.1016/j.cam.2019.02.027.

Devi, F., & Sudirman, I. (2021). The effect of stock selection ability, market timing ability, fund size and portfolio turnover on equity fund performance in Indonesia. *American Journal of Humanities and Social Science (AJHSSR), 5*(3), 55-64.

Doblas, M., Enriquez, J., & Lagara, M. (2020). Price to earnings and price to book ratios as determinants of stock return: The Case of the financial institution listed in Bahrain Bourse. *Journal of Applied Economic Science, 15*(69), 532-539.

Fahling, E. J., Steurer, E., & Sauer, S. (2019). Active Vs. Passive funds - an empirical analysis of the German equity market. *Journal of Financial Risk Management, 8*(02), 73-91.

Ferreira, M. A., Keswani, A., Miguel, A. F., & Ramos, S. B. (2013). The determinants of mutual fund performance: A cross-country study. *Review of Finance, 17*(2), 483-525.Available at: https://doi.org/10.1093/rof/rfs013.

Ferreira, R., & Carvalhal, A. (2017). Market timing of equity funds in Brazil. *Corporate Ownership & Control, 15*(1-1), 193-198.Available at: https://doi.org/10.22495/cocv15i1c1p3.

Fulga, C., Dedu, S., & Şerban, F. (2009). Portfolio optimization with prior stock selection. *Economic Computation and Economic Cybernetics Studies and Research, 43*(4), 157-172.

Glabadanidis, P. (2020). Portfolio strategies to track and outperform a benchmark. *Journal of Risk and Financial Management, 13*(8), 1-26.Available at: https://doi.org/10.3390/jrfm13080171.

Graham, B. (1974). The future of common stocks. *Financial Analysts Journal*, *30*(5), 20-30.Available at: https://doi.org/10.2469/faj.v30.n5.20.

Gusni, G., Silviana, S., & Hamdani, F. (2018). Factors affecting equity mutual fund performance: Evidence from Indonesia. *Investment Management and Financial Innovations, 15*(1), 1-9.Available at: https://doi.org/10.21511/imfi.15(1).2018.01.

Han, B., & Hirshleifer, D. A. (2015). Self-enhancing transmission bias and active investing. *Available at SSRN 2032697*, 57.Available at: https://doi.org/10.2139/ssrn.2032697.

Hassan, H. H., & Hussin, N. (2018). A conceptual framework for the determinants of mutual fund performance in Malaysia. *J. Fin. Bank. Review, 3*(4), 48-53.Available at: https://doi.org/10.35609/jfbr.2018.3.4(2).

Hyndman, R. J., & Athanasopoulos, G. (2018). Forecasting: Principles and Practices, 2nd Edition. A comprehensive introduction to the latest forecasting method using R. Learn to improve your forecast accuracy using dozens of real data examples.

Jermias, Johnny, and FatihYigit.(2019). Factors affecting leverage during a financial crisis: Evidence from Turkey. Borsa Istanbul Review 19: 171–85.

Jian, G. J., Zayutdinova, G. R., & Zhang, H. (2021). Stock-selection timing. *Journal of Banking and Finance, 125*, 106089.

Jiang, G. J., Yao, T., & Yu, T. (2007). Do mutual funds time the market? Evidence from portfolio holdings. *Journal of Financial Economics, 86*(3), 724-758. Available at: https://doi.org/10.1016/j.jfineco.2006.09.006.

Kang, E., Kim, R., & Oh, S. (2019). Dividend yields, stock returns and reputation. *ACRN Jornal fo Finance and Risk Perspective, 8*, 95-105.

Lailiyah, E. H., & Setiawan, R. (2020). Stock selectivity, market timing ability, risk, size, and comparison of performance sharia mutual funds. *Journal of Islamic Economics*, *9*(2), 137-150.

Lucas, S., & Sanz, A. (2016). Pick your battles: The intersection of investment strategy, tax, and compounding returns. *The Journal of Wealth Management, 19*(2), 9-16.Available at: https://doi.org/10.3905/jwm.2016.19.2.009.

Lynch, P., & Rothchild, J. (1990). *One up on wall street*. New York: Simon & Schuster.

Mahmood, F., & Rubbaniy, G. (2016). An analysis of the USA mutual funds sector: What determines performances. *The Lahore Journal of Business, 5*(1), 59-74.

Manelli, A.R.., Pace, and Maria Leone. (2022). Leverage, Growth Opportunities, and Credit Risk: Evidence from Italian Innovative SMEs. Risks 10: 74. https://doi.org/10.3390/risks10040074

Mehta, N., Pothula, V. K., & Bhattacharyya, R. (2019). A value investment strategy that combines security selection and market timing signals. *Available at SSRN 3451859*, 1-16.Available at: https://doi.org/10.2139/ssrn.3451859.

Moksony, F. (1999). Small is beautiful: The use and interpretation of R2 in social research. *Sociological Szemle*, *Special issue*, 130-138.

Otten, R., & Bams, D. (2002). European mutual fund performance. *European Financial Management, 8*(1), 75-101.

Patil, S. (2016). Big data analytics using R. *International Research Journal of Engineering and Technology, 3*(7), 78-81.

Rachmattulah, M. F., & Faturohman, T. (2016). The implementation of benjamin graham criteria (A Case in Indonesia Market). *Journal of Business and Management, 5*(6), 773-783.

Rachmawati, R., Wahyudi, S., & Pangestuti, I. R. D. (2020). Fund manager and mutual funds characteristics on mutual funds performance: Empirical evidence of equity mutual funds in Indonesia. *International Journal of Financial Research*, *11*(2), 77-87.Available at: https://doi.org/10.5430/ijfr.v11n2p77.

Rao-Nicholson, R., & Svystunova, L. (2020). Assessing the role of host country human rights protection on multinational enterprises' choice of investment strategy. *Management International Review*, *60*(2), 177-209.Available at: https://doi.org/10.1007/s11575-020-00413-y.

Rijwani, P. (2014). Stock selection, market timing and mutual fund performance. *Indian Journal of Accounting*, *46*(2), 47-58.

Safitri, Y., Mertha, I. M., Wirawati, N. G., & Dewi, A. (2020). The impact of debt to equity ratio, price earning ratio, earning per share to the stock price on banking sectors listed in infobank15 index 2014-2018. *American Journal of Humanities and Social Science Research (AJHSSR)*, *4*(5), 49-56.

Salehi M, Zimon G, Arianpoor A, Gholezoo FE. (2022) The Impact of Investment Efficiency on Firm Value and Moderating Role of Institutional Ownership and Board Independence. *Journal of Risk and Financial Management*. 15(4):170. https://doi.org/10.3390/jrfm15040170

Sharp, W. (1963). A simplified model for portfolio selection. *Management Science, 9*(2), 277-293.

Sherman, M., O'Sullivan, N., & Gao, J. (2017). The market-timing ability of Chinese equity securities investment funds. *International Journal of Financial Studies, 5*(4), 1-18.Available at: https://doi.org/10.3390/ijfs5040022.

Shokhnekh, A. V., Melnikova, Y. V., & Gamayunova, T. M. (2019). *The investment concept strategy of the development of innovative activities of agricultural organizations in the conditions of techno-economic modernization*. Paper presented at the InsIn Institute of Scientific Communications Conference, Springer, Cham.

Sushko, V., & Turner, G. (2018). The implications of passive investing for securities markets. *BIS Quarterly Review*, 113-131.

Tangjitprom, N. (2014). The effect of fund size on performance: The evidence from active equity mutual funds in Thailand. *Research Journal of Finance and Accounting, 5*(10), 82-86.

Terzi, N. (2016). An assessment on Graham's approach for stock selection: The case of Turkey. *International Journal of Financial Research, 7*(1), 50-56.

Treynor, J., & Mazuy, K. (1966). Can mutual funds outguess the market? *Harvard Business Review, 44*(4), 131-136.

Woltering, R.-O., Weis, C., Schindler, F., & Sebastian, S. (2018). Capturing the value premium–global evidence from a fair value-based investment strategy. *Journal of Banking & Finance, 86*, 53-69. Available at: https://doi.org/10.1016/j.jbankfin.2017.06.009.

Ye, Y. (2013). Application of the stock selection criteria of three value investors, Benjamin Graham, Peter Lynch, and Joel Greenblatt: a case of Shanghai Stock Exchange from 2006 to 2011. *International Journal of Scientific and Research Publications, 3*(8), 1-7.

Zimon, Grzegorz, and Robert Dankiewicz.(2020). Trade credit management strategies in SMEs and the COVID-19 pandemic—A case of Poland. Sustainability 12: 6114.

Zhang, Q., & Chen, P. (2019). Robust optimal proportional reinsurance and investment strategy for an insurer with defaultable risks and jumps. *Journal of Computational and Applied Mathematics, 356*, 46-66.Available at: https://doi.org/10.1016/j.cam.2019.01.034.

Zhou, K., & Wong, M. C. (2014). Timing ability of China mutual fund investors. *Emerging Markets Finance and Trade, 48*(sup3), 116-128.