THE MODERATING ROLE OF INVESTOR ATTRITION ON INVESTOR HETEROGENEITY AND FUND PERFORMANCE TOWARDS FUND FLOW ON INDONESIAN EQUITY MUTUAL FUND INDUSTRY

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ABSTRACT

This study is analyzing the moderating impact of investor attrition on the effect of both investor heterogeneity and fund performance towards fund flow in the Indonesian equity mutual fund industry, to fill the research gap on fund flow determinants resulting from the limited fund flow research from other than fund performance perspectives. Samples being used in this research are all IDR denominated (offshore/ global sharia fund are excluded) active equity funds (index and ETF are excluded) being available in Indonesia under a monthly cut-off basis throughout January 2015 until May 2021, free of survivorship bias. This research documented several anomalies that unlike most of the research results conducted in the US market where most of the mutual fund research came from; both investor heterogeneity and fund performance did not found to have a significant effect on fund flow. On the other hand, even though this research did not find a significant effect that attrition could weaken the fund performance's effect on fund flow, this research documented a cross-interaction that attrition is strengthening the investor heterogeneity effect on fund flow. In other words, this research documented that investor attrition is reversing the previous insignificant effect on investor heterogeneity on fund flow if attrition occurs at a certain rate.

Key words: Attrition, fund flow, investor heterogeneity, fund performance, mutual fund.

INTRODUCTION

In the last 7 years, asset under management (AUM) for equity mutual fund as 1 of the largest 3 asset classes in Indonesian mutual fund, has grown with an equivalent of 5.82% CAGR, from IDR 87.00 Tn in 2013 into IDR 129.24 Tn in 2020. However, there is a hidden problem beneath that overall AUM growth, since such increments in AUM were not linear with the average ticket size (average AUM held per fund) growth where it recorded an equivalent of –6.17% CAGR over the last 7 years. This was because the numbers of available equity mutual fund growth surpasses the growth of the AUM itself, where there are 134 equity mutual funds in 2013, and in 2020 there are 311 equity mutual funds. Such growth of equity mutual fund counts during the last 7 years is equivalent to 12.78% CAGR. In other words, while the equity funds AUM seems growing, but the average AUM per fund in 2013 (IDR 649.22 Bn) is much greater than what it is in 2020 (IDR 415.57 Bn).

Considering the average ticket size is declining amidst the continuous increment of overall equity fund's AUM, it indicates that mutual fund is struggling to generate a positive fund flow into the fund to increase the average ticket size per fund. It is particularly peculiar, given the Jakarta Composite Index as the benchmark for all equity funds itself is growing in the last 7 years, at an equivalent growth rate of 4.91% CAGR. Such indications were even more pressing considering the trend of liquidated funds were increased for equity funds; where despite the increased total equity funds being available in 2020 compared to 2013, more than 25% of equity funds being available in 2013 now gone as of 2020, and the distribution of funds with an increasing amount of investment units are not evenly distributed. Hence, the AUM growth in equity mutual funds is peculiar, since it is occurring at the expense of another fund's outflow.

Thus, all of those conditions mentioned above rises a fundamental yet challenging question for the fund manager on identifying what could generate fund flow into the fund. Given the abovementioned challenging mutual fund industry landscape, unawareness of fund flow determinants could end up in the fund manager's difficulties in executing their investment strategy, because the fund flows are uneasy to predict. The fund manager's difficulties are more heightened when being linked to the increasing numbers of new mutual fund products being launched (as explained in the previous paragraph), as an effort to attract investors' new inflow to maximize the company's AUM. Given the declining rate of average ticket size per fund, had the new fund ended up drawing investors from one fund due to certain myopia (like performance seeking), it could generate an unintended subscription/ redemption/ switching activity in another fund that could be volatile and difficult to manage (Bollen, 2006). Therefore, factors that could affect the fund flows are becoming a concern for fund managers, since fund flows can relate to future fund performance if the fund flows are anticipated or changed (Christoffersen et al., 2014).

Previous research on fund flow itself are quite varied in angle and specialty, with the notorious angle is on the correlation between fund performance and fund flow, where it usually documented that fund performance is affecting fund flow for various reason (Sirri and Tufano, 1998; Lynch and Musto, 2003; Christoffersen and Xu, 2017; Cumming et al., 2019). Moreover, since fund flow into the fund or out from the fund is essentially a result of investor conviction and motives differences, any differences in the investor population base characteristics could also trigger a different fund flow behavior due to the different level of performance sensitivities or herding behavior (Getmansky, 2012; Watson and Wickramanayake, 2012; Ferson and Kim, 2012; Christoffersen et al., 2014; Li, 2017). However, not only there are still limited studies about mutual fund flows in the Indonesian market; but also there is an available gap to those previous research about fund flow. Particularly, on the specific factors affecting fund flow such as attrition, not only in the Indonesian research but also in the global mutual fund research.

Fund outflows will result in a reduction in the managed AUM size which creates attrition. On the other hand, Sirri and Tufano (1998) found that funds with smaller AUM eventually will attract a larger percentage of fund inflows. That seemingly

counter-intuitive cyclical result is even more interesting to be researched, considering it remains unclear whether the Indonesian characteristics are similar to the US characteristics or not, where most of the research in investment took place.

However, even though post-attrition resulted in unfavorably reduced AUM, but attrition could be used by fund managers to measure the predominant type of remaining investors within the fund to reformulate their portfolio strategy. Christoffersen and Xu (2004) argued that after attrition has taken place, the remaining investors tend to be more insensitive towards fund performance. So although it may sound counter-intuitive, attritions might not always be a dead-end for fund managers, since they actually could be benefited from it if they understand such impact on future fund flow, since now they could be more risk-taking (more aggressive) in their investment strategy, because the remaining investors are less sensitive towards performance.

On the other hand, it appears that the investor's performance sensitivity that will trigger the attritions could be moderated by how diverse the investor basis is within that fund itself. Christoffersen and Musto (2002) and Berk and Tonks (2007) in Christoffersen and Xu (2017) explained that even if the fund is performing poorly, investor heterogeneity could affect investors' sensitivity to exiting the fund either due to behavioral effect or other constraints.

This heterogeneity aspect in correlation towards attrition in affecting the fund flow is interesting to be researched, because in the Indonesian market heterogeneity is difficult to be examined due to the lack of consistently available public data to be made as a proxy for heterogeneity, that there is still a gap for examining heterogeneity in respects with attrition that affecting fund flow. Furthermore, there is still limited research about attrition in mutual fund flows in general, let alone in Indonesian capital market research.

This research documented several anomalies that unlike most of the research results conducted in the US market where most of the mutual fund research came from; both investor heterogeneity and fund performance did not found to have a significant effect on fund flow. On the other hand, even though this research did not find a significant effect that attrition could weaken the fund performance's effect on fund flow; this research documented a cross-interaction that attrition is strengthening the investor heterogeneity effect on fund flow. In other words, this research documented that investor attrition is reversing the previous insignificant effect on investor heterogeneity on fund flow if attrition occurs at a certain rate.

METHODS

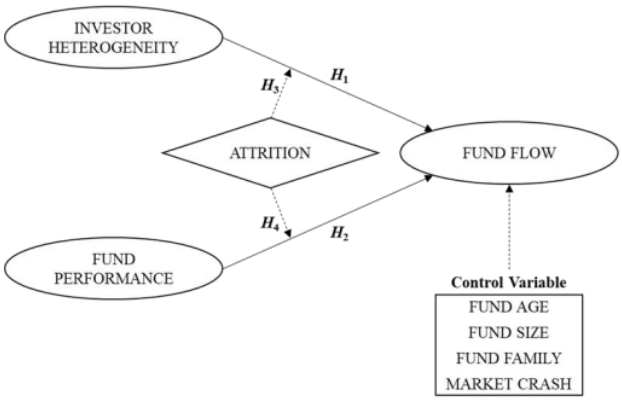

Figure 1 – Research Framework

Figure 1 above reflects the four research objectives to be addressed in this research. First, to investigate the effect of investor heterogeneity on fund flow in the Indonesian mutual fund industry. Second, to evaluate the effect of fund performance on fund flow in the Indonesian mutual fund industry. Third, to analyze the impact of attritions in influencing the effect of investor heterogeneity on fund flow in the Indonesian mutual fund industry. Fourth, to analyze the impact of attritions in influencing the effect of fund performance on fund flow in the Indonesian mutual fund industry. This research also employs 4 control variables, which will be explained separately below.

This research will be conducted using deductive and quantitative approaches under panel data regression in STATA 16.0, and using various secondary data as the main data source. The main data source for variable independent variable of fund performance and attrition will be taken from Infovesta, a survival-bias-free database for Indonesian mutual funds that is commonly used as a data source in the mutual fund and insurance industry. Whereas for investor heterogeneity variable, will be obtained through a combination of manual research that has been conducted by comparing public open-end/ exclusive (institutional investor only) open-end fund status on the fund, by comparing ARIA-OJK's database, product listing per each of selling agent, and Infovesta's database. The control variable will be obtained by combining data from Infovesta and Bareksa, as an APERD (licensed mutual fund selling agent) member that provides a thorough industry-wise product info database.

The research population is open-ended (both public fund and exclusive funds) equity mutual funds in Indonesia. Sampling techniques being used in this research is purposive judgment sampling, where the criteria being set are only to include IDR denominated (USD-denominated global sharia fund are excluded) active fund (index fund and ETF are excluded). The researcher excludes index funds and exchange-traded funds (ETF) because those funds applied an indexing/ passive investing approach that possesses different traits compared to active funds in equity asset classes. From the population of 310 equity open-ended mutual funds in Indonesia (as of May 31, 2021 cut-off date alone) and the equity mutual fund population per month are

varied, the total sample selected based on the above criteria covering the observation period from January 2015 until May 2021 are 16,860 observed sample throughout 77 observation months, free from survivorship bias. Table 1 below summarizes the sample selection.

Table 1 – Summary of Sample Selection

Description		Mutual Fund Count
Total cumulative equity mutual fund available in a given year	**:**	
▪ From January 2015 until December 2015	:	1,630 mutual funds
▪ From January 2016 until December 2016	:	2,095 mutual funds
▪ From January 2017 until December 2017	:	2,508 mutual funds
▪ From January 2018 until December 2018	:	3,032 mutual funds
▪ From January 2019 until December 2019	:	3,448 mutual funds
▪ From January 2020 until December 2020	:	3,631 mutual funds
▪ From January 2021 until May 2021	:	1,494 mutual funds
Total non-IDR denominated equity mutual fund available in a given year	**:**	
▪ From January 2015 until December 2015	:	(44 mutual funds)
▪ From January 2016 until December 2016	:	(112 mutual funds)
▪ From January 2017 until December 2017	:	(153 mutual funds)
▪ From January 2018 until December 2018	:	(166 mutual funds)
▪ From January 2019 until December 2019	:	(162 mutual funds)
▪ From January 2020 until December 2020	:	(222 mutual funds)
▪ From January 2021 until May 2021	:	(101 mutual funds)
Total observed sample (77 months)	**:**	**16,860 mutual funds**

Table 2 below provides summary statistics on the variable being used in this research. FLOWT1 is the dependent variable (Fund Flow), whereas this research was intended to see whether the fund flow in the upcoming month (T+1) was influenced by several variables being used in this research. A negative amount means the fund is experiencing fund outflow (redemption or switching out) that surpasses its inflow (subscription or switching in). EXCESSRETURN is an independent variable (fund performance) to see whether the discrepancies between year-on-year (YoY) return generated by that funds against YoY return recorded for the Jakarta Composite Index. The greater the amount, the greater the fund's capability in beating the benchmark; and vice versa for the negative score. Throughout the observation period, most equity mutual funds were indeed experiencing fund outflow and unable to beat the market/ benchmark, since the average score on both FLOWT1 and EXCESSRETURN are negative.

Table 2 – Descriptive Statistics

Variable	Obs.	Average	St.Dev.	Minimum	Maximum
FLOWT1	16,860	-0.002029	0.2474055	-1.10205	9.992269
EXCESSRETURN	16,860	-0.049777	0.1666305	-0.93759	3.728795
Variable	**Obs.**	**Public fund**		**Exclusive fund**	
		Obs	***(%)***	***Obs***	***(%)***
HETEROGENEITY	16,860	12,083	71.67%	4,777	28.33%
Variable	**Obs.**	**Average**	**St.Dev.**	**Minimum**	**Maximum**
ATTRITION*EXCESSRETURN	16,860	-0.032042	0.097298	-0.8911453	1.705884
ATTRITION*HETEROGENEITY	16,860	0.340015	0.348227	0	0.999935
FUNDAGE	16,860	5.922776	4.813036	0.9945205	24.88767
FUNDSIZE	16,860	25.51436	1.893035	15.18784	30.54078
FUNDFAMILY	16,860	6.921471	4.533417	1	20
Variable	**Obs.**	**Normal period**		**Crash period**	
		Obs	***(%)***	***Obs***	***(%)***
MARKETCRASH	16,860	12,623	74.87%	4,237	25.13%

FLOWT1: Fund flow in the upcoming month (FLOW T+1); **EXCESSRETURN:** Fund's surplus return above-market return; **HETEROGENEITY:** Public Fund that has various investor or Exclusive Fund that comprised of single investor (mostly institutional clients); **ATTRITION*EXCESSRETURN:** the interaction of Excess Return with a fund's Attrition; **ATTRITION*HETEROGENEITY:** the interaction of Heterogeneity with a fund's attrition; **FUNDAGE:** the age of the fund since its inception date as per the respective cut-off period; **FUNDFAMILY:** count of total equity fund owned by the respective asset management company; **MARKETCRASH:** the period when Jakarta Composite is in a crash due to Covid-19 pandemic.

Using panel data under monthly cut-off data from January 2015 until May 2021, the regression model in this research itself are as follows:

$$FLOW_{i,t+1} = \alpha + \beta_1 EXCESS\_RETURN_{i,t} + \beta_2 HETEROGENEITY_{i,t} + \beta_3 (ATTRITION_{i,t} \times HETEROGENEITY_{i,t}) + \beta_4 (ATTRITION_{i,t} \times EXCESS\_RETURN_{i,t}) + \beta_5 FUND\_AGE_{i,t} + \beta_6 FUND\_SIZE_{i,t} + \beta_7 FUND\_FAMILY_{i,t} + \beta_8 MARKET\_CRASH_{i,t} + \varepsilon_{i,t}$$

The operationalization of FUND FLOW as a dependent variable is as follows. It is measured by the changes of net Asset Under Management between period T and period T+1 after removing the effect of portfolio return, as proposed in Sirri and Tufano (1998) in Christoffersen and Xu (2017):

$$FLOW_{i,t+1} = \frac{AUM_{i,t+1} - (AUM_{i,t} \times (1 + RETURN_{i,t+1})}{AUM_{i,t}}$$

Where FLOW is the fund flow in the one month ahead as measured by real changes of AUM after removing the portfolio return and stated in decimals. AUM is the total fund size at the end of the period and expressed in full nominal. RETURN is the monthly net return of a fund, expressed in decimals.

FUND FLOW itself is simply defined as the overall capital flow, or changes in AUM net of asset appreciation (Cumming et al, 2019). Investor's irrational decision-making tendency under emotions or limited knowledge to sell winners too quickly or hold losses too long as suggested by Shefrin & Statman (1985) and Odean (1998) is what lays as the trigger towards fund flow (Gruber, 1996; Chevalier and Ellison, 1997; Sirri and Tufano, 1998). Therefore, Singal and Xu (2011) argue that prospect theory under the application of disposition effect developed by Kahneman and Tversky in 1979 is what best suited for explaining the fund flow phenomenon, because the past disposition effect will affect the current fund flow since the disposition effect is a personal trait that makes it relatively hard to be changed.

Understanding the fund flow is important for practitioners to understand what is the important influences on consumers' financial thinking was, for a particular reason. Not only do fund flows is reflecting the decisions of a large portion of the society (Christoffersen et al., 2014), but also fund flows has a significant impact at both macroeconomic and microeconomic levels since investment in mutual funds influences consumer savings and consumer future wealth, as per mentioned by Ferson and Kim (2012) in Kopsch et al. (2015).

The EXCESS_RETURN is the first independent variable, as a measurement for fund performance. It is measured by the difference between 1-year fund return against 1-year market return in a given month, stated in decimal. Warther (1995) in Fant (1999) suggest that the performance (return) could only affect the fund flow if the investors are a performance chaser. Complementing that research, Li (2017) also noted that well-performing funds will attract more fund flow. On the other hand, Christoffersen and Xu (2017) in their research upon institutional versus retail fund flow documented that sophisticated investors not only use past performance as their sole indicator to make an investment decision. It suggests that past performance might not always be linear with fund flow if the client type were being put into considerations. However, from the Indonesian perspective, Indrakusuma (2020) mentioned that even pension funds in Indonesia still utilize certain annual target returns and exposed themselves to unnecessary risks; considering the pension fund's nature is supposedly risk-averse. It implies that investors in Indonesia are still following a performance-chasing behavior, regardless of whether it is a sophisticated or unsophisticated investor.

The HETEROGENEITY is the second independent variable, to represent investor heterogeneity. It takes the form of a dummy variable where it takes 1 if the fund is a public fund, and takes 0 if it is an exclusive fund. Christoffersen et al. (2014) argued that within a heterogenic fund, the investors will be different across funds and time, within its dimensions that are relevant to future and prior fund flows. In a mutual fund that is comprised of heterogeneous investors, investors' decisions to enter, exit, or stay in the fund will be different, according to their respective rationale or behavioral reason, in different timing and manner. Investor heterogeneity could explain the lack of investors' sensitivity that prevents them to respond to poorly performing funds, either due to investor behavioral differences or other constraints (Christoffersen and Musto, 2002; Berk and Tonks, 2007). Ferson and Lin (2011) argue that heterogeneous investors usually provide a weaker fund flow as a response if being exposed towards performance measured by alpha. However, research by Ferson and Kim (2012) emphasizes that heterogenic retail investors are relatively less capable than homogeny institutional investors in terms of their capability to continue investing during a liquidity shock. Christoffersen and Xu (2017) also suggest that institutional fund flow is less reflecting the performance chasing behavior than retail flows.

The explanation of moderating variables being deployed is as follows. ATTRITION is the moderating variable where it measures the comparison of the current fund size to its maximum historical size, and calculated as 1 – (FUND $SIZE_{i,t}$ ÷ HISTORICAL MAX FUND $SIZE_{i,t}$). The historical maximum fund size is determined since the fund inception even though the observation period of fund size might be different in the cut-off period. It was put in the form of ATTRITION x HETEROGENEITY and ATTRITION x EXCESS_RETURN, as an interaction to measure in a more precise manner whether attrition rate is strengthening the fund performance sensitivity and investor heterogeneity towards future fund flow, respectively.

ATTRITION itself is defined as a phenomenon for a company where its customers are either left or getting churned because a customer in competitive markets are having numerous alternatives that they can easily switch to any service provider (Dash and Das, 2017; Yongkil et al., 2020). In regards to the moderating capability of attritions on investor heterogeneity effect on fund flow, Ferson and Kim (2012) suggest that if a fund is comprised of a heterogenic investor base, the tolerance or sensitivity in facing shock in a fund will be different for each investor. Christoffersen and Xu (2017) argue that if a fund is comprised of homogeny investors, it will have the same performance sensitivity that attrition has little effect on the fund flow. It implies that the more heterogenic the investor base within a fund is, the more capable it is for attritions to affect the fund flow. In regards to the moderating capability of attritions on fund performance effect on fund flow, there are several different probabilities. Christoffersen and Xu (2017) posit that a high attrition rate could magnify the performance and flow sensitivity, only when the recent fund

performance is bad. On the contrary, there is another probability where attrition might not affect the fund performance to fund flow relationship because after attrition occurs, the only remaining investor is the less performance-sensitive investor that is stickier while hoping for the fund manager to take corrective action (Lynch and Musto, 2003; Christoffersen and Xu, 2017).

FUND_AGE is a control variable in the form of age stated in years of the fund from inception date until period *t*, originated by Chevalier and Ellison (1997), who's documented that an older fund tends to have a less sensitive relationship between performance and fund flow. Fund age effect towards fund flow could vary because it will have different performance results depending on the circumstances, whether it could utilize its differences in complexities and accumulated resources (Jones, 2007; Webster 2002).

FUND_SIZE is a control variable in the form of a natural log of nominal AUM, to control for inconclusiveness on the relationship's direction between fund size, fund performance, and fund flow (Phillips et al., 2018). Fund size might have either have an inverse or linear effect towards fund performance and fund flow differences, due to differences in economies of scale, complexities, and flexibilities in size to exercise market inefficiencies without causing price impact (Chen et al., 2004; Jones, 2007).

FUND_FAMILY is a control variable in the form of total fund counts in equity funds owned by a particular company. It aims to control for fund flow reaction due to competitive advantage differences (stock-picking and sell-side research coverage) between the larger and smaller family, and a star performer status in a fund that could have a ripple effect on fund inflow into the rest of funds in the same fund family (Bhojraj et al., 2012; Nanda et al., 2004 in Christoffersen et al., 2014).

MARKET_CRASH is a control variable in the form of a dummy variable to represent liquidity shock due to pandemic that led to inevitable liquidity shock where Jakarta Composite Index is down 37.49% in just 3 months, without being fully recovered as of May 2021. It will be scored 1 during the Covid-19 era which began from March 2020, and given 0 if the Covid-19 era has not begun yet. Wang et al., (2018) documented that when being faced with volatility that impacted the investment performance, it turns out that investors react negatively to that volatility that it led to a greater fund outflow, while fund flow from the institutional investor to exploit arbitrage opportunities could only be done if the institutional investor has adequate funding liquidity to withstand the market shock (Wang et al., 2018).

From the panel data estimation approach using Chow test, Hausman test, and Langrange test, this regression was conducted under RE model. Before conducting the significance test, this regression has cleared the classical assumption test and fulfilled BLUE (best linear unbiased estimator) assumption, where there is no breach on multicollinearity, heteroscedasticity, and autocorrelation issue.

RESULT AND DISCUSSION

This research uses a directed hypothesis, so the result reported is in one-tailed significance, where the Prob>Chi2 is less than 0.05 so that all independent variables are having the same effect on the dependent variable simultaneously. However, the interesting part lies in the coefficient determination (Adj. R^2) result, which is considerably peculiar in this case. The regression result will be summarized in Table 3 below.

Table 3 – Summary of Regression Result, One-Tailed

VARIABLE	EXPECTED SIGN	COEFFICIENT	SIGNIFICANCE
HETEROGENEITY	(+)	-0.0142	0.913
EXCESSRETURN	(+)	0.0311	0.101
ATTRITION * HETEROGENEITY	(+ / >)	0.0608	0.0040***
ATTRITION * EXCESSRETURN	(- / <)	0.1577	0.991
FUND_AGE	(+)	-0.0027	0.978
FUND_SIZE	(+)	-0.0028	0.789
FUND_FAMILY	(+)	-0.0022	0.998
MARKET_CRASH	(-)	-0.0095	0.025**
Prob > Chi2 :	0.0014		
Adj. R^2 :	0.0034		

EXCESSRETURN: Fund's surplus return above-market return; **HETEROGENEITY:** Public Fund that has various investor or Exclusive Fund that comprised of single investor (mostly institutional clients); **ATTRITION*EXCESSRETURN:** the interaction of Excess Return with a fund's Attrition; **ATTRITION*HETEROGENEITY:** the interaction of Heterogeneity with a fund's attrition; **FUND_AGE:** the age of the fund since its inception date as per the respective cut-off period; **FUND_FAMILY:** count of total equity fund owned by the respective asset management company; **MARKET_CRASH:** the period when Jakarta Composite is in a crash due to Covid-19 pandemic.

:** significant at 10% level; *:** significant at 5% level; *****:** significant at 1% level

As could be seen above, the Adj. R^2 somehow is very small that it could only score 0.34%. It means that these independent variables could only represent 0.34% about fund flow in the Indonesian equity mutual fund since there might be a lot of other factors that affect fund flow, where it could be different than most of the research under the common United States literature.

Researchers predict that there are 2 probabilities in this case that could explain this condition. First, because there might be other micro-perspective factors other than the independent variables being deployed that matters more in catering fund flow, that has yet to be researched but the macro-level data are not available; like management fee, transaction cost, advertisement, media

attention, market timing behavior, etc. (Sirri & Tufano, 1998; Munoz, et al., 2014). Second, there might be certain non-endogenous factors like foreign flow to the capital market, etc., that might contribute more than a performance-related aspect that might play a significant role given the Indonesian mutual fund commercial landscape itself. Such condition is similar with the French's mutual fund where its distribution practices are dominated by banking and insurance industries, that their decisions in recommending certain funds to their clients that will bring fund flow, were influenced by factors other than fund performance like commonly found in the US market where most mutual fund flow research was conducted (Bellando and Tran-Dieu, 2011).

The first hypothesis in this research is investor heterogeneity inside the fund has a positive effect on fund flow. However, the regression result in Table 3 in HETEROGENEITY shows that investor heterogeneity does not affect fund flow, unlike as predicted before. Such a result might indicate that throughout the observation range, compared to an institutional investor in an exclusive fund, a retail investor in a public fund is unable to generate more fund flow, unlike what has been hypothesized. Researchers predict there might be several reasons regarding this contradictory result.

First, regarding the differences in retail investors' capability to continually invest compared to the institutional investor that it resulted in fund flow result differences. Ferson and Kim (2012) explain that when the market is experiencing a liquidity shock due to unfavorable market conditions, retail investors are relatively less capable than an institutional investors to continue investing and reflected in fund flow. Furthermore, institutional investors are more capable to execute contrarian investing since they're deemed to rely more on fundamental values and focus on alpha during bad times while retail investors can't, which explains why fund flow are retail funds are relatively more common to not experiencing a fund flow (Salganik-Shoshan, 2017; Humphrey et al., 2013). And considering the last 5 years, the global market volatility is considerably higher than before 2016, in their research, Salganik-Shoshan (2017) also documented that retail investors are reacting negatively towards unfavorable market exposure and resulting in a lack of fund flow. To further explain the behavioral differences between retail and institutional investors in generating fund flow, Sourirajan and Natarajan (2021) in their research argues that retail investors treat mutual funds as trading securities similar to stock investing, that they are only interested in short-term speculative money-making rather than stay invested for longer investment duration. Thus, such behavior resulted in a negative correlation on retail funds towards fund flow.

Second, regarding the segregation of investor heterogeneity that might not be able to be segregated into a simple public (retail) fund versus exclusive (institutional) fund dichotomy to get a better grasp on heterogeneity. In their research, Humphrey et al., (2013) argue that even inside retail investors themselves have different segments, that it might require different fund flow determinants for each of different retail segments. Therefore, within the same base of heterogenic investors, the reaction towards fund flow between 2 funds could be different, particularly if there is a fund theme differentiation put into the equation. Further primary research on these topics is required.

Third, regarding the probability of measurement of investor heterogeneity that might be better in prediction power if using investor numbers based on investor's Single Identification Number (SID) within each fund from the custodian, instead of using a comparison between public and exclusive funds. However, to the best of the researcher's knowledge, most of the research in this area were still using the comparison method between public and retail funds, since the SID data required to measure investor heterogeneity are considered to be classified and difficult to obtain.

The second hypothesis in this research is fund performance has a positive effect on fund flow. The idea is that most investors are considered as a return/ performance chaser, including the institutional investor (Indrakusuma, 2020). This assumption is driven by the feedback trader hypothesis that investors will chase market returns, therefore the fund flow is predicted to lag with market return (Warther, 1995, in Humphrey et al., 2013). However, it turns out that the regression result in Table 3 above on EXCESSRETURN shows that fund performance in a fund did not have a significant effect on fund flow, where it is not in accordance with most of the previous research where it is commonly found that fund performance is positively correlated with fund flow, despite the different convexity between public funds that consist of heterogenic investor base versus an exclusive fund that consists of a homogeny investor base, that became the benchmark of this research (Christoffersen and Xu, 2017; Li, 2017; and Indrakusuma, 2020). Researchers predict there might be several explanations regarding this result.

First, because mutual fund selling/ distribution system hinders the capability of fund performance in solely affecting fund flow. Indonesian mutual fund industry is different compared to the United States (US) mutual fund environment where most of the mutual fund research came from. In Indonesia, mutual funds were mostly distributed/ sold through the commercial banks as an agent, similar to the French and Australian markets. Such condition makes the distribution system is a captive to commercial banks' interest, in which their decision to market/ endorse certain funds in their product line-up might be affected by elements other than past performance (Bellando and Tran-Dieu, 2011). A similar condition was faced in the Australian market, where commercial banks also serve as mutual funds wholesalers, where a retail customer needs to purchase mutual funds through commercial banks. It led to clientele effect according to the bank's interest or policy in endorsing certain mutual fund, and Australian retail investors did not observe whether the fund's return is actually above or below peers in making their transaction (Sawicki, 2001, in Jun et al., 2014).

Second, because of return understanding asymmetry, considering this research use excess return as fund performance measurement. This contrarian research result is similar to what Jondeau and Rockinger (2004) found in their research, where the attractiveness of a fund to cater fund flow did not relate to the fund's past performance. They argue that in general investor seems unable to tell the difference between funds with standard performance against the benchmark, versus funds with higher performance against the benchmark. Furthermore, in assessing fund performance effect towards fund flow, fund performance based on raw return might explain better than another type of return basis since investors generally have low to standard financial literacy that led to behavioral bias in interpreting non-raw fund performance information (Ruenzi, 2005 and Patel et al., 1994; in Bellando and Tran-Dieu, 2011). Even without non-raw fund performance measures, investor in general are already having an ambiguity in transforming multiple information signals (raw fund performance in 1-month, 3-months, 6-months, 1-year, and year to date) being stated in Fund Fact Sheet, since they can't identify which fund performance information are the one that is relevant for them upon making a purchase decision (Loeis and Prijadi, 2015).

Third, because of investors' cognitive dissonance, a psychological biases where investors neglect reality to justify their past choices. Goetzmann and Peles (1997) in Bellando and Tran-Dieu (2011) explains that investor tends to overestimate the fund performance for the fund they've selected and purchased. However, when the fund performance did not occur as their expectation,

there is a bias recollection regarding past performances which led them to seek justification of their previous overestimation to adjust their beliefs and moral support to reduce the psychological effect, that led to the disposition effect and there is no change in fund flow even though the fund performance is bad (Goetzmann and Peles, 1997, in Jun et al., 2014).

Fourth, due to the combination of investors' shorter investment duration (where this research use only excess return under 12 months basis) and different common investing behavior, that cause flow-performance relation is not the same as in the most United States (US) literature. In their research, Rakowski and Wang (2009) documented that mutual fund investors are not investing in mutual fund, but trade securities through mutual fund. Therefore, they are considered as a momentum trader at monthly or quarterly frequencies, with conflicting evidence in regards to fund performance and fund flow relationship. Hence, 12 months return were not suitable in that condition since their fund performance's benchmark are shorter in duration, particularly since the behavior of mutual fund traders (instead of the investor) and their determinants of selling/ buying decisions that will result in fund flow are different than the common mutual investor type.

On another perspective, Bellando and Tran-Dieu (2011) also argue that fund flow might not be as affected by fund performance like in the US circumstances, particularly in a specialized segment like the Asian market, where fund attractiveness that will lead to fund flow is more towards trend or momentum related instead of past fund performance. Such condition is supported with research conducted in the Chinese market by Jun et al., (2014) where not only did they find that Chinese's flow-performance relations are also different than the US flow-performance relations, but also its market circumstances are considered to be similar with Indonesia. Mutual fund in Chinese market was relatively new as it only established in 2001; not very much different than Indonesia which was established in 1996 by Danareksa Mawar fund owned by PT Danareksa Investment Management. And just as in the French and Australian markets, both Chinese and Indonesian mutual fund distributions are centralized in commercial banks due to their economies of scale in geographical coverage. With that background similarity, in their research, Jun et al., (2014) point out that flow-performance relations are different than most of US literature because there are different mutual fund investing behavior as a result of these 5 factors: investment opportunities are relatively limited, investors trade more frequently due to a shorter investment holding period than the US mutual fund's investor, more overconfident than the US investor, more prevalent in herding behavior than mutual fund investors in other markets, and vulnerable to market movements to the point that their investment sentiment and behavior shows a highly volatile pattern.

The third hypothesis in this research is fund attrition will strengthen the effect of investor heterogeneity towards fund flow. The idea is that since a heterogenic investor base will be comprised of different performance sensitivity and risk tolerance capabilities, attritions will have an impact in increasing heterogeneity's effect on fund flow (Ferson and Kim, 2012; Christoffersen and Xu, 2017). Regression result in Table 3 above on ATTRITION* HETEROGENEITY shows that the interaction of heterogeneity and fund flow indeed has a positive significant effect on fund flow, as predicted.

However, it is interesting to note that when the main effect in the first hypothesis on HETEROGENEITY did not find any significant correlation towards fund flow; the interaction with attrition as a moderating variable is found to significantly strengthen investor heterogeneity's effect on fund flow. Thus, it could be interpreted as a cross-over interaction where it can reverse the insignificant effect of investor heterogeneity on fund flow if the attrition itself is occurring at a certain rate.

The third hypothesis in this research is intended to determine whether fund attrition will weaken the effect of fund performance towards fund flow. The idea is that since attrition has made the performance-sensitive investors redeem the fund, the remaining investors are having less performance-sensitive that it will not further increase the fund outflow and resulted in a negative fund flow, as suggested in Christoffersen and Xu (2017). However, it turns out that the regression result in Table 3 above on ATTRITION*EXCESSRETURN shows that the interaction of fund performance and fund flow surprisingly has a positive correlation towards fund flow even though not significant, but it is not negative as expected.

Researcher predicts the plausible probabilities on this contradictory result is because the remaining investor in a fund after attrition has occurred, are still performance sensitive. No dichotomy between performance-sensitive investor and non-performance-sensitive investor in the Indonesian market, as per suggested by Christoffersen and Xu (2017) before. This condition is similar to the customer landscape found in Rakowski and Wang (2009), where mutual fund investors are essentially momentum traders that has conflicting evidence with the common notion of fund performance and fund flow relations. Therefore, all Indonesian mutual fund investors are performance-sensitive or performance seekers, just as documented by Loeis and Prijadi (2015). Therefore, when a particular fund suffers from attrition due to the bad fund performance, the remaining investors are actively attempting to exit the fund through switching or something and resulted in a higher fund flow, instead of patiently waiting while hoping that the fund manager will improve the fund's performance (Lenard et al., 2003).

In regards to the four control variables in this model, this research did not provide an expected sign in correlation towards fund flow as shown in Table 3 above, because these control variables are not the primary research objective. However, except for MARKET_CRASH that is significantly negatively correlated towards fund flow just as expected; all of the remaining control variables show no significance towards fund flow, contrary to the expectation. Such results are different than most other research results, where most of them dominantly came from the US market.

In regards to FUND_AGE, most of the US literature on fund flow shows that it has a positive correlation towards fund flow. The consideration on that positive correlation was based on some research that stated the longer fund age is perceived as a proxy reflecting quality by investors (Hada and Suri, 2020), and the longer fund age possesses higher probabilities to score a better fund performance since the knowledge, experiences, and resources have been accumulated (Webster, 2002). However, the insignificant result of fund age towards fund flow in the Indonesian equity mutual fund industry suggest that perhaps Indonesian customer did not emphasize fund age when purchasing a fund. Such phenomenon is similar to previous findings by Bergstresser and Poterba (2002) in Jun et al., (2014) where they found that mutual fund investors tend to dislike older funds since older funds grow more slowly compared to the younger funds. It is possible that older funds and younger funds are having differences in risk-bearing capability in making up investment because Ferreira et al., (2013) in their research also found that younger funds show better capabilities than the older funds in exercising promising investment opportunities.

In regards to FUND_SIZE, this research shows that it has no significant effect on fund flow, unlike in the US literature where it is commonly found that it has a positive effect on fund flow. Researcher predicts that all of those conditions are close to what Bellando and Tran-Dieu (2011) found in the French mutual fund industry, where fund size is found to have a significantly

negative correlation towards fund flow. They argue that since the smaller fund has a higher growth rate compared to the large fund, surely investor seems to prefer the smaller funds given the investors are keen to chase return regardless of their bias towards past fund performance. Such arguments were based on the considerations that the larger the AUM a fund has, the harder it will be to score an exceptional fund performance because of the diseconomies of scale it inherently has upon executing trade position due to the growing cost of share liquidity (Berk and Green, 2004, in Abramov and Akshenteva, 2015).

In regards to FUND_FAMILY, this research also shows no significant effect on fund family towards fund flow. This phenomenon is also contradictory with the US literature since it is expected that the numbers of fund families are positively correlated with fund flows. Sirri and Tufano (1998) in Jun et al., (2014). They argue that if the larger the fund family, the more media coverage will be gathered to that Asset Management Companies (AMC), and the less the effort or cost it will be for an investor to shortlist the mutual fund they're about to purchase. However, this research result implies that the greater the count of equity funds owned by a particular AMC did not translate into a larger fund flow they will receive. Such inverse logic is similar to what Jondeau and Rockinger (2004) have found in the French market. They argue that since AMC is a captive towards commercial bank's interest as a wholesaler, there will be a bank bias phenomenon where the bank's promotional activity is the one that matters in endorsing certain funds, instead of the number of the fund family. In another word, no matter how much mutual fund per AMC is being enlisted in the bank's product line-up, in the end, it is up to the bank's decision to endorse certain funds according to its interest.

CONCLUSION AND RECOMMENDATION

This research intends to analyze the moderating impact of investor attrition on the effect of investor heterogeneity and fund performance towards fund flow in the Indonesian equity mutual fund industry, in order to understand more on what could affecting the fund flow into mutual fund. This research contribution is uncovered several anomalies that open up possibilities for future research, where it is necessary to understand the exact fund flow determinants in Indonesian mutual fund industries; especially since most of the result is not in accordance with previous research being conducted in the US market.

Unlike most of the research results conducted in the US market where most of the mutual fund research came from, both investor heterogeneity and fund performance (first and second research objective) did not found to have a significant effect on fund flow. This research also did not find that attrition could weaken the effect of fund performance against fund flow (fourth objective). However, this research documented a cross-interaction that attrition is strengthening the investor heterogeneity effect on fund flow (third objective). Hence, investor attrition is reversing the previous insignificant effect on investor heterogeneity on fund flow, if attrition occurs at a certain rate.

Therefore this research provides managerial insights to help fund managers in being cautious of the moderating effect of attrition towards investor heterogeneity on fund flow; that it is better if Asset Management Company (AMC) to be aware of investor attrition when managing public/ retail funds, particularly when their funds have a sensitivity towards limited liquidity stocks in the underlying portfolio. The reason is that while this research didn't find any evidence that retail investors in the public fund could generate more fund flow compared to the institutional investor; attrition is found to reverse that condition. Thus, once a certain level of attrition has occurred in the abovementioned type of public fund, the fund manager should be more careful not to blindly overweight on limited liquidity stocks portfolio on the upcoming inflow to chase superior potential return since the risk of future outflow could be even greater.

For future research on this topic, there are several recommendations based on the limitations of this research. First, employs other endogenous variables (for example management fee, transaction cost, marketing effect, distribution channel, investor segregation etc.) and exogenous variables (media attention/ news coverage, macroeconomic indicators, etc.) to be added to the equation for future research; since the standard measures commonly used in secondary data research in US market turns out to be different than Indonesian market. Second, use the amount of investor's SID (Single Identification Number) registered by KSEI (*Kustodian Sentral Efek Indonesia*) within each fund, instead of public fund (retail investor) or exclusive fund (institutional investor) dichotomy. Third, use raw return across different duration (1-month, 3-months, 6-months, 12-months, and year-to-date) to ascertain which period does it best to capture fund performance ability in influencing fund flow, instead of using excess return in a single period.

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THE MODERATING ROLE OF INVESTOR ATTRITION ON INVESTOR HETEROGENEITY AND FUND PERFORMANCE TOWARDS FUND FLOW ON INDONESIAN EQUITY MUTUAL FUND INDUSTRY

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