On the Underestimation of Risk in Hedge Fund Performance Persistence: Geolocation and Investment Strategy Effects.

William Joseph Klubinski and Thanos Verousis*

(Essex Business School, University of Essex)

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Abstract: Despite the exponential increase in the literature related to the performance of Alternative Investment Funds (AIFs), risk management with respect to the measurement of performance persistence remains largely unexplored. In this paper, we investigate the impact of geolocation and investment strategy effects on the estimation of risk in performance persistence measurement dynamics. This aspect of risk in performance persistence is crucial as it allows us to show the combined effects of geolocation and investment strategy choice on risk-adjusted performance persistence. We report strong performance persistence when analysing the individual domicile or strategy. However, as we move to consider a combination of both domicile and the investment strategy, we can observe diminished persistence as well as its loss and reversal. The results of our cross-comparison show that the sole reliance on the individual domicile/investment strategy focused clusters can be grossly misleading and lead to capital losses.

**Essex Business School, University of Essex, Wivenhoe Park, Colchester Campus, CO4 3SQ, United Kingdom*

E-mail addresses: w.klubinski@essex.ac.uk (W. J. Klubinski), t.verousis@essex.ac.uk (T. Verousis).

Introduction

The last three decades have seen a gradual but significant increase in interest in Alternative Investment Funds (AIFs) (commonly known as hedge funds). The extreme expansion of the industry has seen its value increase from approximately US$118.2bn in 1997 to US$3.55tn in November 2017 (Prequin, 2018). In this paper, we investigate the impact of geolocation and investment strategy effects on the estimation of risk in performance persistence measurement dynamics.

An accurate appraisal of AIF performance must recognise that AIFs' risk exposure to investment styles is constantly shifting as managers are able to change the fund's focus. In that respect, risk management in AIFs is prone to systematic biases as exposure to risk factors is changing (see Bollen and Whaley, 2009). Further, AIFs' strategies expose investors to high correlation risk (see Buraschi et al, 2014). Since their inception in the 1950s, AIFs were always looked to for their astonishing performance (Bridgewater, Soros, and Citadel)[1] which in turn has gradually elevated their reputation to 'the money-making machines' (Rittereiser and Kochard, 2010, pp. 196). The industry did not thrive without controversies, and more specifically significant exposure to left-tail risk (see Agarwal and Naik, 2004) and defaults (Amaranth Advisors, LTCM, and Tiger Management)[2].

The literature related to the performance persistence of AIFs has grown exponentially in the last two decades. Nevertheless, despite its wide coverage of all the years from approximately the late 1977s until 2018, utilisation of all major databases and variety of methodologies, risk management with respect to the measurement of performance persistence remains largely

[1] Bridgewater: (net gains) approx. $50bn since 75', Soros: approx. $42 (73'), Citadel: approx. $25bn (90')

[2] Amaranth Advisors losses = approx. $6.5bn, LTCM = approx. $4.6bn, Tiger Management = approx. $2bn

unexplored. One of the areas where AIF risk management is crucial is geolocation, as the majority of academic research focuses on one (or a combination of) of the following approaches in data analysis: The globally aggregated approach (all AIFs in one portfolio), the investment strategies (all AIFs aggregated in portfolios based on their primary investment strategy), or the data clusters (some of which are based on the fund-specific properties, e.g. low, medium or high return portfolios). The only studies that we have come across that disrupted the aforementioned pattern, focused on the Asian and Australian (Koh, Koh and Teo, 2003), Italian (Steri, Giorginob and Vivianib, 2009) and solely Australian (Do, Faff & Veeraraghavan, 2010) AIF universes.

Therefore, in this chapter, we are going to assess the performance persistence of AIFs in the sphere of geolocation and identify whether the country of domicile and the investment strategy impact on their risk dynamics. The additional side objective of this investigation is to contribute to the scarce literature concerning the previously noted non-US AIFs domiciles (Koh et al., 2003; Steri et al., 2009; Do et al., 2010).

In order to provide an adequate perspective for the analysis of performance persistence, we have employed both non-parametric contingency tables and parametric regressions. The analysed sample of AIFs in this study comes from the EurekaHedge database. The sample data aggregates 5619 AIFs (post-processing) and spans January 1995 to October 2016. Interestingly, the period covered in our analysis consists of two major economic events (the Russian financial crisis of 1998 (combined with the LTCM's collapse) and the sub-prime mortgage crisis of 2007), what may be of interest particularly to the potential AIF investors.

In our analysis, we have focused on the world's four most saturated domiciles (USA, CAYI, LUX and IRL) and the four most commonly employed strategies (LSE, CTA, FIX and MLTI).[3]

We have several findings to report. We show that metrics based on the individual domiciles and (separately) the investment strategies indicate the existence of short-term performance persistence. However, as we move to consider a combination of both domicile and the investment strategy, we can observe diminished persistence as well as its loss and reversal. Interestingly, one can draw a parallel between the geo-strategic combinations exhibiting high risk and the positive level of persistence. To provide greater depth into our analysis, we have further employed a two-step parametric regression method. In the first instance, we have computed the performance persistence on raw data without consideration for risks crystallising in the AIFs. The results reveal dominant and statistically significant negative performance persistence in portfolios such as IRL and the USA (a result previously unseen under the non-parametric approach). The same goes for the geo-strategic combinations and domiciles employing either the LSE or MLTI strategies. In the second instance, we have enhanced our parametric method to account for the risks materialising in the AIFs. The accountability for risk has completely changed the outcomes for some of the individual domiciles and the investment strategies, as they have all moved into a positive and statistically sig. territory (except for IRL). As to the cross combinations, we no longer observe any negative performance persistence across domiciles practising the LSE approach. A similar reversal and in effect a dominance of the positive β_p coefficients occur at the MLTI level.

The results of our analysis for both the non-parametric and parametric approaches uncovered differences in performance persistence between the general overview of the domicile,

[3] Table 1 provides a list of abbreviations.

investment strategy and a combination of two. Furthermore, we prove that the sole reliance on either the general domicile or on the investment strategy level focused clusters can be grossly misleading and lead to undesirable consequences.

The definition of risk propagated by the participants in the AIFs industry very often varies. Therefore, the results of this study are specifically relevant to AIF investors. Primarily, the performance persistence of the AIFs is far more important than in mutual funds, as it has a bigger impact on the fund's survival (Agarwal and Naik, 2000a). Secondarily, the results of our study allow potential investors for more educated investment decisions. We clearly show that the sole reliance on either the general domicile or on the investment strategy level focused clusters can be grossly misleading and lead to undesirable consequences.

The rest of the chapter is organised in the following way: Section 2.0 discusses the previous literature; Section 3.0 analyses the database and provides descriptive statistics; Section 4.0 discusses the methodology; and Section 5.0 provides the interpretations of the results; Section 6.0 concludes.

Insert Table 1

1.0 Performance Persistence

This section discusses the literature on the performance persistence of the AIFs. In general, we show that the magnitude of performance persistence amongst AIFs exhibits a high degree of variation that is conditional on the country of domicile and investment strategy. We classify papers depending on whether the country of domicile is defined or undefined. To provide more clarity on the literature around AIFs, the data has been dissected based on the results: short and long-term persistence.

1.1 Undefined Domiciles

The following sub-sections aggregate all studies which do not explicitly denote the domicile of the AIFs they have analysed. Since the domicile focus is unknown/undefined, it is assumed that the entire databases (pre/post-cleaning) were collated to reflect the AIF industry.

1.1.1 Short-Term Persistence

Ever since the inception, the research into the performance persistence of the AIFs has rarely explored its full potential. The researchers were mostly focused on either the aggregation of the global hedge fund universe under one umbrella or/and the division based on the investment strategy. The frequent omission or underestimation of the domicile factor has not provided a complete risk-accountability, much needed in the case of the AIFs. The modern performance persistence analysis of the AIFs began with the research of Park and Staum (1998). Their research was not only one of the first to focus on performance persistence but also controlled for the survivorship bias[4]. In their results, they have shown the evidence of performance persistence at annual horizons (with substantial variations from year to year) within the aggregated universe of the AIFs pursuing the CTA strategy. In the following year, Brown et al. (1999) focused again just like their predecessors, on the aggregated universe of AIFs, this time domiciled outside of the United States, identifying performance persistence in

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[4] Survivorship bias refers to one of the most frequent and momentous weaknesses in statistical data analysis. The omission of its existence can result in erroneous investment decisions, which derive from statistically distorted data. It can be specifically responsible for overstating active hedge funds/mutual funds' performance and in effect misleading investors. In the literature, survivorship bias is depicted in a two-dimensional spectrum: as a disparity in returns between live and defunct funds and/or the disparity between live & the aggregated universe (live + defunct) (e.g. Fung and Hsieh, 1997 Ackermann, McEnally and Ravenscraft 1999; Liang 2000; Malkiel and Saha, 2005).

years 1991-1993, which reversed in the next two years. Their research was one of the first to depart from a commonly adopted aggregation of the all-in-one portfolio, focusing only on non-US funds. For approximately the same period but with significantly larger sample size, Edwards and Caglayan (2001) identified persistence with both winning and losing AIFs at both annual and bi-annual horizons, which differs significantly by the investment style. They have also indicated, that the performance persistence of the AIFs can be attributed to the exploitation of market inefficiencies, which can be attained due to a relative lack of regulatory oversight. Other researchers pointed also towards interesting factors influencing performance persistence. Thus, with Liang (1999) we can learn that the performance of AIFs can be enhanced by the incentivisation of the AIFMs. While Boyson (2003) shows that young-skilled AIFMs are the driving force behind quarterly performance persistence.

Bares, Gibson and Gyger (2003) show that Relative Value and Specialist Credit focused AIFs exhibit the strongest persistence amongst all six of the analysed strategies. Others, such as Amenc, Bied and Martellini (2003) identify 8 out of 9 analysed investment strategies exhibiting performance persistence (i.e. exceeding 0.5 baselines in the Hurst Index [HI]) with Managed Futures being the only strategy below 0.5 in the HI (0.465), i.e. a mere 0.025 below the baseline. Brown and Goetzmann (2003) further show that the performance persistence of AIFs varies significantly across investment strategies. Another approach, which continuously focuses on the aggregation of the AIF universe comes from Capocci and Hubner (2004), who identified persistence only for the mid-range (average return portfolio) AIFs. This result was further confirmed by Capocci, Corhay and Hübner (2005). Moreover, the authors show that Global Macro and Market Neutral were able to consistently outperform market returns. The supportive study comes from Harri and Brorsen (2004) and also shows, that Market Neutral and FoHFs exhibit the strongest (short-term) persistence with Event-Driven and Global/Macro (see also Agarwal and Naik (2000a), Hentati-Kafell and Peretti (2015) and Gonzalez, Papageorgiou and Skinner (2016)). Kosowski, Naik and Teo (2007) and Joenvaara, Kosowski and Tolonen (2012) further show that some investment strategies exhibit stronger persistence (on the annual horizon); Long-Short Equity, Directional Traders, Relative Value and FoHFs. Their cluster-size focused analysis shows, that the small AIFs exhibited strong annual persistence, whereas large AIFs persistence is much weaker. Moreover, they have identified that persistence amongst AIFs is sensitive to fund-specific limitations, e.g. share restrictions or the AuM.

1.1.2 Long-Term Persistence

In relation to long-term performance persistence, Kouwenberg (2003) has identified persistence on a three-year horizon, noting that the selection of persistently performing AIFs has been suppressed by a large number of funds disappearing from the market (see also Jagannathan, Malakhov and Novikov (2010)). While, Sun, Wang and Zheng (2012) demonstrated that AIFs exhibit strong persistence within five years of their inception. The other factors, influencing the performance persistence were identified by Bae and Yi (2012), who has shown that AIFs with inflow/outflow restrictions exhibit superior (winning) performance over the other funds. Finally, Ammann, Huber and Schmid (2013) showed that AIFs' characteristics (AuM and leverage ratio) impact upon their long-term performance persistence. Their findings reaffirmed Kouwenberg's (2003) results, indicating (Alpha) performance persistence on the horizons of up to 36 months with statistically significant over 6 months and substantial (yet insignificant) during 24 months for all three analysed strategies: Equity Market Neutral, Global Macro and Emerging Markets.

1.2 Defined Domiciles

The following sub-section aggregate all studies, which denote the domicile of the AIFs they have analysed. It is worth noting that there are no studies with defined domiciles that investigate the long-term performance persistence of AIFs.

Agarwal and Naik (2000a) were one of the first proponents to analyse AIFs based on domicile. In their research, they have identified significant quarterly performance across all ten investment strategies, which successively diminished at bi-annual and annual levels. Their other research identified quarterly persistence attributable to continuously losing, rather than winning AIFs (Agarwal and Naik, 2000b). Interestingly, they have underlined that analysing performance persistence amongst AIFs is far more critical than that of mutual funds, due to its impact on their longevity (i.e. default rates). Chen and Passow (2003) continued reliance on the US-based AIFs market, showing that the AIFs with lower exposure to the factors identified by Agarwal and Naik (2000b) exhibited superior performance during both adverse and advantageous market conditions. Further work by Baquero, ter Horst and Verbeek (2005) also built on Agarwal and Naik's (2000b) research and found that performance analysis can be hampered by significant attritions in databases (mainly due to the fund's liquidations or the lack of continuous reporting to the database).

In the Asian and Australian AIFs universe, Koh et al. (2003) employed single and multi-period persistence analysis, identifying performance persistence at monthly and quarterly intervals. The same result has been achieved by Henn and Meier (2004) who also identified significant persistence on the monthly and quarterly bases, which diminished towards the annual horizon. It is important to notice that despite describing and providing statistical descriptions of specific investment strategies, their non-parametric (contingency table) persistence analysis focused solely on the aggregated universe. Steri et al., (2009) have also analysed the European environment, focusing on their analysis on the Italian AIFs, confirming monthly persistence but demonstrating that this persistence differs on quarterly and semi-annual horizons. In an important note, the peculiarity of the Italian AIFs industry is that 95% of AIFs are FoHFs. Further results also indicate that the Italian FoHFs exhibited lower performance when contrasted with traditional asset classes, i.e. stocks/bonds/commodities.

Another, this time solely focused on the Australian market study by Do et al. (2010) have shown that the Australian AIFs exhibit short-term monthly persistence.

Overall, the review of the literature uncovers significant limitations in terms of geolocation focus. Majority of the aforementioned research focuses on either globally aggregated approach, i.e. all AIFs under one umbrella, usually divided based on the investment strategy, or the data clusters based on the fund-specific properties, such as the AuM, returns, flows. Given the scarce literature concerning defined domiciles, this chapter will analyse the performance persistence of the AIFs in the sphere of geolocation and identify whether the country of domicile and the investment strategy matter.

2.0 Data

2.1 Database

The Alternative Investment Funds (AIF) data used in this research comes from the EurekaHedge[5] database. EurekaHedge is the world's largest alternative investment data provider and consists of more than 28500 investment vehicles (as of January 2017) according to Capocci (2013). Additionally, EurekaHedge provides a much more comprehensive reflection of the contemporaneously reporting hedge funds universe than (for example) Lipper, HFR or MorningStar, as noted by Joenvaara et al. (2012). Currently, the largest AIFs data providers on the market are EurekaHedge, Lipper, HFR, Morningstar, Barclays Hedge, and CISDM (see Table 2). Thus, from the perspective of a single data source, this research utilises the dataset with the highest saturation of contemporaneously reporting AIFs in the world.

Insert Table 2

The research timeframe covers the period from January 1995 to October 2016. Before the analysis was undertaken, we filtered the data to retain the AIFs domiciling solely in the United States, Cayman Islands, Luxembourg and Ireland (due to the extensive saturation of these domiciles). We have further limited our dataset by selecting the four most prominent investment strategies within each domicile: Long-Short-Equity (LSE), Fixed-Income (FIX), Commodity-Trading-Advisors (CTA), and Multi-Strategy (MLTI). This way we have reduced the initial dataset from 16678 AIFs to 11197[6]. Further reductions occurred due to missing/not-

[5] For more detailed description, please visit www.eurekahedge.com
[6] The null hypothesis of the unit root is uniformly rejected. The results are available upon request.

disclosed observations in sections such as management and performance fees, assets under management (AuM) and lockup and redemption periods.

Another important aspect of the data cleaning process is the potential existence of duplicate funds, previously identified by Aggarwal and Jorion (2010), and Bali, Brown and Caglayan (2011), whose analysis eliminated duplicate fund classes and all other funds of which correlation was either equal to or exceeded 0.99. Therefore, we investigated our database and removed all duplicate classes and all AIFs where the correlation was either equal to or greater than 0.99. For the robustness check, we have also analysed the data where the correlation threshold has been set at 0.95 and subsequently at 0.90. This operation (0.99) as well as the removal of all funds with a lifespan equal to or shorter than six months limited our collective data set to 5619 AIFs across four domiciles (USA 2302, CAYI 2034, LUX 853, IRL 430) or four investment strategies (CTA 1212, FIX 912, LSE 2928, MLTI 567).

2.2 Descriptive Statistics

In this section, we are looking at the descriptive statistics of the aforementioned domiciles and their associated investment strategies. Table 3 comprises the USA (Panel A) and CAYI (Panel B), LUX (Panel C) and IRL (Panel D). Furthermore, each domicile has been divided into four most commonly employed strategies (within the EurekaHedge database). The data gathered in this table aggregates 5619 AIFs. A significant proportion of the AIFs domiciled in the USA and CAYI can be classed as defunct as they did not report any returns in October 2016. The case of the other two domiciles is much less severe, nevertheless in almost all cases across IRL (except CTA) and LUX more than 50% of the AIFs are classed as defunct. Furthermore, the negative skew of the returns dominates all domiciles and strategies apart from the CTA (all domiciles) and LSE (USA, CAYI and IRL) strategies. In addition, the kurtosis has exhibited non-normal properties across all domiciles and strategies. With regards to the average returns, the USA and its strategies dominate all other cases with LUX and IRL generating the lowest returns.

Insert Table 3

3.0 Methods

The investigation of performance persistence relies on two different approaches: contingency tables (non-parametric) and regressions (parametric). We undertook all our tests at monthly intervals for the timeframe between January 1995 and October 2016.

The non-parametric method consists of widely utilised contingency tables (see Brown and Goetzmann 1995; Agarwal and Naik 2000a; Eling 2009, Do et al. 2010). The anchor value which serves as a performance benchmark is the median return of all funds across all four domiciles and specific investment strategies. Thus, the fund which exceeds (is below) the median return is considered a winner (loser) and denoted as WW (LL). Whereas, the winner (in the first period), transforms into a loser (in the second period) as WL or LW if the opposite is true. This non-parametric measure uses three different metrics: cross-product ratio (CPR), Z-statistic (Z) and Chi-square (X^2). The CPR defines the odds ratio of the funds, which exhibit performance persistence as opposed to those that do not. Its fundamental null hypothesis is $CPR = 1$, implying no persistence (when WW=25%, LL=25%, WL=25%, LW=25%). Carpenter and Lynch (1999) conclude that X^2 test based on the number of winners and losers is well specified, powerful and more robust to the presence of biases compared to other non-parametric methodologies. The CPR can be denoted as:

$$CPR = \frac{(WWxLL)}{(WLxLW)} \quad (1)$$

The statistical significance of the CPR has been measured through the application of the standard error of the natural logarithm ($\alpha_{\ln(CPR)}$) what results in a Z-statistic, which is the ratio of $\alpha_{\ln(CPR)}$ to the standard error of the $\ln x \equiv log_e x$. Thus, in parallel to Z ~ N (0,1^2) → Z, whenever the value of 1.96 or 2.58 (for 5% and 1% confidence interval respectively) is exceeded, significant performance persistence occurs. The Z-statistic can be denoted as:

$$Z = \frac{\ln(CPR)}{a_{ln_{(CPR)}}} = \frac{\ln(CPR)}{\sqrt{\frac{1}{WW}+\frac{1}{WL}+\frac{1}{LW}+\frac{1}{LL}}} \quad (2)$$

Lastly, the chi-square (X^2) compares the observed frequency distribution of all four denominations with the expected frequency distribution. Thus, if the value of X^2 for one d.f. exceeds 3.84 or 6.64 (for 5% and 1% confidence interval respectively), we can observe a significant performance persistence. The chi-square can be denoted as (where n is the number of funds in a given period):

$$X^2 = \frac{\left(WW - (\frac{(WW+WL)(WW+LW)}{n})\right)^2}{\frac{(WW+WL)(WW+LW)}{n}} + \frac{\left(WL - (\frac{(WW+WL)(WL+LL)}{n})\right)^2}{\frac{(WW+WL)(WL+LL)}{n}} + \frac{\left(LW - (\frac{(LW+LL)(WW+LW)}{n})\right)^2}{\frac{(LW+LL)(WW+LW)}{n})} + \frac{\left(LL - (\frac{(LW+LL)(WL+LL)}{n})\right)^2}{\frac{(LW+LL)(WL+LL)}{n}} \quad (3)$$

Furthermore, we have computed the percentage of repeating winners (PRW).

$$PRW = \frac{WW}{WW+WL} \tag{4}$$

On the contrary, the parametric approach employs the XR to identify performance persistence. Unlike Do et al. (2010), our XR calculation measures the XR of an individual AIF in contrast to the median (and not the average) return of all AIFs within the same domicile and strategy. The reason for this change lies within the predominantly skewed return distributions of the analysed AIFs (see Table 3). The XR approach is then further enhanced into AXR to account for the risks associated with the AIFs investments. The AXR measures the XR of an individual AIF in contrast to the median (and not the average) return of all AIFs within the same domicile and strategy. It is further divided by the residual standard deviation from a linear regression of the AIF's return on median returns from AIFs within the same domicile and strategy.

$$XR_{it} = a_n D_n + a_p D_p + \beta_{i,n} D_n XR_{i,t-1} + \beta_{i,p} D_p XR_{i,t-1} + \varepsilon_{it} \tag{5}$$

$$D_n = 1 \; where \; XR_{i,t-1} < 0 \; and \; D_p = 1 \; where \; XR_{i,t-1} > 0$$

$$AXR_{it} = a_n D_n + a_p D_p + \beta_{i,n} D_n AXR_{i,t-1} + \beta_{i,p} D_p AXR_{i,t-1} + \varepsilon_{it} \tag{6}$$

$$D_n = 1 \; where \; AXR_{i,t-1} < 0 \; and \; D_p = 1 \; where \; AXR_{i,t-1} > 0$$

With regards to the dummies of D_n and D_p, they stand for negative (lose) and positive (win) returns. While the $\beta_{i,n}$ and $\beta_{i,p}$ identify the level of return autocorrelation of the AIFs amongst the negative and positive cases respectively.[7]

[7] E.g., the $\beta_{i,n}$ with a significant positive figure implies the existence of the autocorrelation or persistence of the negative (lose) cases. On the contrary, the $\beta_{i,p}$ implies the autocorrelation or persistence amongst positive (win) cases.

4.0 Empirical Results

4.1 Non-Parametric Methods

The following sub-sections outline the results of the two approaches. The first individually examines domiciles and investment strategies while the second deals with the combination of both. The results unequivocally confirm the existence of short-term performance persistence across all of the examined universes, regardless of whether it is the individual domicile/strategy or a combination. However, when we increase granularity and begin to focus on smaller clusters, we observe the equal number of persistent cases (WW versus LL) in the USA (CTA & FIX), CAYI_FIX and IRL (LSE & FIX) registered funds as well as the loss and reversal of persistence in places such as LUX (all strategies) and IRL_MLTI.

5.1.1 Domiciles and Investment Strategies

Tables 4 and 5 present results of the non-parametric method with regards to the mean and total number of the AIFs exhibiting winning (WW) and losing (LL) cases of persistence (section 4.0). Tables 4 and 5, each consists of two panels which reflect the domicile (Panel A) and separately the strategy (Panel B) of the analysed AIFs. On the contrary, Tables 6 and 7 consists of 4 different panels (A: USA, B: CAYI, C: LUX and D: IRL) reflecting the domiciles combined with the investment strategies, which are directly associated with Tables 4 and 5 and provide the statistics for the non-parametric test. The timeframe of for this data is January 1995 through to October 2016 (262 months) and aggregates 5619 AIFs.

Insert Table 4

The initial examination of Table 4 shows us that in all cases, regardless of whether we are considering the domicile or the investment strategy alone, the number of funds denoted as WW dominates all other instances (i.e. LL, WL or LW). Such an outcome implies positive performance persistence at the very start of our analysis; as such we examine further the statistical results of the CPR, X^2, Z-statistics and the PRW.

The domicile focused analysis (Table 5, Panel A) indicates that the CPR and X^2 show statistical significance at 5% (1%) in 126 (112) and 181 (159) out of 262 months for the USA domiciled AIFs. The PRW is greater than 50% in 165 out of 262 cases (or 63%). The average (total) CPR of all USA based AIFs is 1.79 (1.30), rejecting the null hypothesis of no persistence in 196/262 cases. Whereas the total (average) X^2 for the entire sample, is 26.96 (1.64), which reaffirms that the AIFs domiciled in the USA exhibit short-term (monthly) performance persistence.

Similarly, the funds domiciled in the CAYI exhibit the CPR and X^2 in 123 (102) and 160 (135) out of 262 months respectively. Their mean and total CPR stands at 1.95 and 1.49 implying performance persistence in 196 out of 262 months. The mean and total X^2 exceed the value of 1.96 for the sig. at 5%, further demonstrating persistence. The PRW, in this case, is much higher (than in the USA) and is equal to 195 (or 74%).

The number of months where LUX based AIFs exhibit significance at 5% (1%) for CPR and X^2 stands at 79 (66) and 127 (99). The mean (2.68) and total (1.27) CPR differ from the value of 1 and as it can be seen with Z-stat (13.91) exhibit persistence.

Lastly, the CPR and X^2 of the IRL domiciled funds show statistical significance at 5% (1%) in 63 (39) and 109 (64) out of 262 months. With the mean (total) CPR of 3.27 (1.20) and the Z-stat of 7.59 they do exhibit performance but to a lesser magnitude than the other domiciles.

In Table 5, Panel B, we can observe the same number of the AIFs (5619), however, this time they have been dissected based on their investment approach: LSE, CTA, FIX and MIRL. All strategies defy the null hypothesis of the CPR and report more than 190 out of 262 months (in every case), representing the existence of performance persistence. The total Z-stats is significant in all cases. Furthermore, as it was the case with domiciles, every single type of strategy generates PRW >50%.

Insert Table 5

5.1.2 Domiciles Combined with Investment Strategy

The combination of domiciles and investment strategies allowed us to provide significantly greater granularity. The initial assessment of Table 6 already reveals that all of LUX strategies and IRL_MLTI are dominated with losing (LL) cases of performance persistence. The panels A-D of Table 7 correspond to the following domiciles, each with four specific strategies (LSE, CTA, FIX and MLTI): the USA, CAYI, LUX and IRL. The total X^2 and Z-stats of all strategies in the USA (Panel A) is highly significant at 5%. Moreover, the percentage of repeating winners above 50% dominates across all strategies. The trends in CAYI (Panel B) are similar to the USA across all strategies except CTA. The CTA's total CPR stands at 1.07 which confirms the default null hypothesis of no persistence. While the total Z-stats stands at 2.31 which is approximately 10 times lower than the other strategies (such as FIX and LSE) within this domicile. The Z-stat at 5% shows only 44 out of 262 months of persistence. Therefore, this particular strategy (CTA in CAYI) exhibits weak performance persistence.

Insert Table 6

In contrast to previously described domiciles, the results for the European ones, LUX (Panel C of Table 7) and IRL (Panel D) differ significantly. Immediately apparent are the LUX_CTA and IRL_CTA which generate the total CPR that is in line with the null hypothesis of no persistence. Neither LUX nor IRL CTA strategy exhibits significance at 5% for either the Z-stat or the X^2. Therefore, they do not exhibit significant performance persistence. Moreover, the PRW in LUX is below the 50% threshold for both LSE and CTA strategies. Similarly, the IRL's CTA and FIX strategies are at PRW 40 and 42 respectively with the remaining two at 53 (LSE) and 55 (MLTI) per cent.

Insert Table 7

We have evaluated performance persistence through the idea of comparing 'winning' and 'losing' alternative investment funds returns in each period over 262 months. Moreover, this comparison has been enhanced with statistical measures of the CPR, X^2 and Z-statistic at both 1 and 5 per cent significance. We have seen that the analysis based individually on either the domicile or the investment strategy of the AIFs does not provide a full overview of the risks lurking for potential investors. After expanding the scope of the analysis, we have shown that the individual strategies *combined* within domiciles such as IRL and LUX tend to underperform and do not maintain significant performance persistence.

4.2 Parametric Methods

5.2.1. Non-Risk Adjusted

5.2.1.1 **The Domicile and Investment Strategies**

In this section, we analyse the results of a non-risk-adjusted parametric performance persistence test for the individual domiciles (Panel A) and investment strategies (Panel B) presented in Table 8. Panel A shows that the majority of the AIFs across LUX and CAYI dominate with positive $\beta_{i,p}$ and statistically sig. (at 5%) cases over the number of $\beta_{i,n}$ coefficients. The exception to this is the USA and IRL, where the number of positive and statistically sig. $\beta_{i,n}$ casesdominate $\beta_{i,p}$. Despite no signs in our non-parametric analysis, in this case, the USA and IRL exhibit negative performance persistence. In terms of the investment strategies (Panel B), the only approach where the $\beta_{i,n}$ cases dominate is MLTI – the difference between the significant cases is minimal and stands at 316/315 cases.

Insert Table 8

5.2.1.2 Domicile Combined with Investment Strategy

Continuing with our more in-depth perspective, we turn to Table 9, which aggregates the combination of domiciles and the investment strategies. Table 9, Panel A (LSE) shows that the number of funds exhibiting positive $\beta_{i,p}$ amongst those domiciled in the USA, stands at 792 out of 1159 with 654 sig. at 5% level, while for CAYI it stands at 937 out of 1275 with 783 statistically sig. Concerning the other two domiciles, LUX exhibits positive $\beta_{i,p}$ at 197/276 with 178 sig. at 5% and IRL at 137/218 with 118 sig. at 5%. The contrarian, negative $\beta_{i,n}$ coefficient implies that 579 (USA), 730 (CAYI), 130 (LUX) and 120 (IRL) AIFs exhibit significant (at 5%) losing performance persistence. The exception is again the IRL domicile, which when combined with the LSE strategy continues to minimally exhibit dominant losing properties. Overall, the application of the XR performance persistence method indicates some short-term persistence, specifically of a positive magnitude (except IRL).

Table 9, Panel B represents the second most populated investment strategy in our analysis, namely the CTA with 1212 total AIFs: USA (787), CAYI (262), LUX (106) and IRL (57). In this case, Panel B shows that the number of positive $\beta_{i,p}$ coefficients (sig. at 5%) dominates over the negative ones in all cases, which correlates with the results from Table 8 (Panel B). Furthermore, Panel C aggregates 912 AIFs employing the FIX strategy: USA (187), CAYI (230), LUX (371) and IRL (124). Panel C shows that the number of funds exhibiting positive (at 5%) $\beta_{i,p}$ ($\beta_{i,n}$) in the USA stands at 94 (88), LUX at 228 (189), while the on the contrary, negative cases (losers) dominance can be seen in CAYI at 117 (129) and IRL at 61 (73).

Lastly, Table 9, Panel D gathers the lowest number of the AIFs in our dataset, pursuing the MLTI strategy with the total number of 567 funds: USA (169), CAYI (267), LUX (100) and IRL (31). Focusing on panel D we can observe that the number of positive $\beta_{i,p}$ ($\beta_{i,n}$) (at 5%) coefficients for the USA stands at 89 (97), IRL at 15 (17), while LUX at 64 (60) and CAYI 147 (142). Simultaneously, making CAYI the only domicile, which is capable of delivering positive performance persistence while employing the MLTI investment strategy.

Insert Table 9

5.2.2. Risk-Adjusted

5.2.2.1 **The Domicile and Investment Strategies**

Further to the previous non-risk-adjusted parametric approach, we provide here risk-adjusted analysis (AXR). In the domicile only scenario (Panel A of Table 10), the IRL is no longer dominated by the negative values and instead regains its positive dominance with 230 cases for $\beta_{i,p}$ (sig. at 5%) versus 197 for $\beta_{i,n}$. This reversal implies that the AIFs located in IRL regain their positive performance persistence after being adjusted for risk. Another peculiar case refers to the LUX domicile, which in this environment begins to underperform and generates 427 negative versus 417 positive cases.

In the realm of investment strategies only (Panel B of Table 10), there is no more dominance of negative persistence as it was the case in the XR analysis (MLTI strategy). Despite the positive performance persistence, the number of statistically significant cases which exhibit persistence is much lower than it was in the non-risk-adjusted analysis (e.g. CTA down from 706 to 578, LUX 1733 to 1464, LSE 500 to 470 and MLTI 315 to 283).

Insert Table 10

5.2.2.2 Domicile Combined with Investment Strategy

In this sub-section, we provide the risk-adjusted (AXR) analysis of domiciles combined with the investment strategies. Table 11, Panel A indicates that all of the domiciles employing the LSE strategy exhibit performance persistence. In Table 11, Panel B (CTA) we can observe that the persistence trend for the CTA strategy in LUX and CAYI reverses in post-risk-adjustment case. Thus, the LUX is dominated by negative values in 56 ($\beta_{i,p}$) to 41 ($\beta_{i,n}$) and CAYI 123 to 129. The FIX strategy (Panel C) exhibits trend reversal in performance persistence when comparing non-risk-adjusted and risk-adjusted approaches. The domiciles CAYI and IRL where positive performance persists in XR reverses into negative territory in AXR. While the same reversal occurs in the USA and LUX which no longer generate positive persistence in the post-risk-adjusted scenario. Lastly, Panel D shows that the MLTI strategy for LUX domiciled funds has been dominated by the AIFs exhibiting losing performance persistence.

Insert Table 11

In summary, from the autoregressive perspective, we have found performance persistence amongst all strategies. Furthermore, in certain instances, we have observed trend reversals between the XR and AXR parametric approaches. Our results vary and cannot unilaterally confirm Do et al. (2010) nor Agarwal and Naik's (2000b) outcomes, which held that the majority of the persistence is on the negative side. Lastly, the applicability of the risk-adjusted testing proves that the simple approach (excluding risk) of the XR can be misleading in assessing performance persistence of the AIFs.

5.0 Conclusion

The value of the AIF industry has increased from approximately US$118.2bn in 1997 to US$3.55tn in November 2017. Equally, there is a large increase in the number of studies focusing on the performance persistence of AIFs. However, to our knowledge, the area of risk management with respect to the measurement of performance persistence remains largely unexplored. In this paper, we have analysed four of the world's most saturated AIFs domiciles and four of the most commonly employed investment strategies for the period between January 1995 and October 2016. We employ parametric and non-parametric analysis. Our objective was to investigate the impact of geolocation and investment strategy effects on the estimation of risk in performance persistence measurement dynamics. We show new evidence regarding the performance persistence rankings when total (combined) risk is taken into consideration.

The results unequivocally confirm the existence of short-term performance persistence. However, we show that some domicile/strategy combinations do not represent attractive investment opportunities. In that respect, pre-adjusted performance persistence analysis that looks at risk in isolation can lead to erroneous investment decisions and loss of the investment capital.

The results of this study are primarily relevant to AIF investors. We clearly show that the sole reliance on either the general domicile or on the investment strategy level focused clusters can be grossly misleading and lead to undesirable consequences.

6.0 Tables

Table 1: Abbreviations

Abbreviation	Explanation
AIF/s	Alternative Investment Fund/s
AIFM/s	Alternative Investment Fund Manager/s
AuM	Assets under Management
CTA	Commodity Trading Advisors are primarily AIFs trading futures contracts
FIX	Fixed-Income
FOHFs	Funds of Hedge Funds
HFR	Hedge Fund Research
LSE	Long-Short-Equity
MLTI	Multi-Strategy

Table 2: World's primary AIFs databases

Database	# of live AIFs	# of defunct AIFs
EurekaHedge	9 722	12 138
Lipper	7 500	11 000
HFR	7 200	16 000
MorningStar	7 000	12 000
Barclays Hedge	6 366	17 965
CISDM	5 000	11 000

Note: The figures refer to the total number of contemporaneously reporting AIFs (as of January 2017).

Table 3: Descriptive Statistics

Panel A

United States	CTA [Obs.787]				FIX [Obs.187]				LSE [Obs.1159]				MLTI [Obs.169]			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max		S.D.	Min	Max	Mean	S.D.	Min	Max
Dead/Alive	0.70	0.46	0.00	1.00	0.63	0.49	0.00	1.00	0.72	0.45	0.00	1.00	0.75	0.43	0.00	1.00
Negative Skew %	0.40	0.49	0.00	1.00	0.52	0.50	0.00	1.00	0.49	0.50	0.00	1.00	0.57	0.50	0.00	1.00
Skewness	0.18	1.23	-5.86	5.63	-0.14	1.76	-7.98	6.26	0.06	0.98	-4.40	6.42	-0.26	1.39	-6.35	5.28
Kurtosis	3.30	5.32	-1.64	48.70	5.92	9.00	-0.97	69.61	2.69	4.54	-1.52	72.08	4.79	6.62	-1.15	52.90
Std. Dev. of r	5.33	4.71	0.29	73.90	1.98	1.57	0.07	12.06	4.39	4.18	0.36	107.54	3.37	2.69	0.31	19.67
AVG r	0.77	1.29	-3.47	15.01	0.73	0.60	-1.26	5.62	0.74	1.58	-46.22	5.17	0.70	0.66	-2.69	3.38
Age [yrs]	7.02	5.23	1.10	21.90	6.35	4.30	1.20	21.90	7.34	5.01	1.10	21.90	7.74	5.31	1.30	21.90
AVG AuM	35.86	132.65	0.10	2203.50	338.78	2208.07	0.10	29776.90	75.54	355.35	0.10	9437.80	212.81	561.79	0.20	5843.00
MED AuM	29.52	114.50	0.00	1788.00	336.81	2218.79	0.00	29903.00	64.36	285.23	0.00	7710.00	190.22	506.22	0.00	5262.00

Panel B

Cayman Islands	CTA [Obs.262]				FIX [Obs.230]				LSE [Obs.1275]				MLTI [Obs.267]			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Dead/Alive	0.73	0.45	0	1	0.65	0.48	0.00	1.00	0.76	0.42	0.00	1.00	0.78	0.42	0.00	1.00
Negative Skew %	0.41	0.50	0	1	0.60	0.49	0.00	1.00	0.56	0.50	0.00	1.00	0.52	0.50	0.00	1.00
Skewness	0.13	1.00	-5.90	4.753	-0.44	2.00	-8.15	6.93	-0.01	0.94	-3.50	6.73	-0.08	1.51	-7.27	6.81
Kurtosis	2.14	4.25	-1.40	37.557	7.73	11.98	-0.93	86.99	2.47	4.19	-1.20	70.36	4.63	8.19	-1.20	72.80
Std. Dev. of r	4.45	3.09	0.67	22.3	2.84	5.26	0.04	73.32	4.02	2.84	0.40	36.09	3.94	4.09	0.44	47.95
AVG r	0.44	1.22	-3.99	9.319	0.62	1.24	-3.97	14.71	0.53	0.83	-9.35	7.15	0.48	0.93	-3.54	5.60
Age [yrs]	6.54	4.67	1.2	21.9	5.95	3.87	1.20	19.40	6.35	4.08	1.20	21.90	6.43	4.12	1.20	19.70
AVG AuM	113	553.46	0.5	7734.4	165.91	252.11	0.30	1821.20	95.40	178.58	0.10	2127.50	204.32	456.28	0.30	3870.60
MED AuM	102.1	521.35	0	7659	159.28	260.76	0.00	1863.00	84.31	166.83	0.00	2024.00	176.78	400.11	0.00	3471.00

Panel C

Luxembourg	CTA [Obs.106]				FIX [Obs.371]				LSE [Obs.276]				MLTI [Obs.100]			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Dead/Alive	0.58	0.50	0.00	1.00	0.26	0.44	0.00	1.00	0.46	0.50	0.00	1.00	0.50	0.50	0.00	1.00
Negative Skew %	0.48	0.50	0.00	1.00	0.69	0.46	0.00	1.00	0.63	0.48	0.00	1.00	0.73	0.45	0.00	1.00
Skewness	0.01	0.68	-1.57	4.82	-0.44	0.99	-4.39	3.42	-0.20	0.92	-8.97	3.96	-0.35	0.88	-4.64	2.81
Kurtosis	1.09	3.92	-0.92	37.90	2.77	4.28	-0.90	35.15	1.86	6.22	-1.08	92.48	1.82	4.49	-1.14	29.62
Std. Dev.	3.83	2.37	0.56	11.94	1.30	0.83	0.03	5.66	2.79	1.87	0.62	11.45	1.67	1.49	0.26	11.66
AVG r	-0.08	0.62	-2.84	1.62	0.15	0.35	-0.66	3.40	0.26	0.54	-1.91	2.55	0.12	0.26	-0.85	1.02
Age [yrs]	5.54	4.14	1.10	21.90	5.91	3.85	1.20	22.70	4.75	2.88	1.10	16.30	4.68	2.41	1.10	16.80
AVG AuM	104.83	201.97	1.00	1454.70	1138.01	2000.87	1.00	8770.60	201.14	292.38	1.00	1696.80	1006.92	2686.33	1.00	16200.90
MED AuM	93.91	172.58	0.00	1414.00	1137.01	1999.38	1.00	8806.50	168.17	246.94	1.00	2048.50	987.94	2660.18	1.00	16018.00

Panel D

Ireland	CTA [Obs.57]				FIX [Obs.124]				LSE [Obs.218]				MLTI [Obs.31]			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
Dead/Alive	0.42	0.50	0.00	1.00	0.73	0.45	0.00	1.00	0.53	0.50	0.00	1.00	0.52	0.51	0.00	1.00
Negative Skew %	0.40	0.49	0.00	1.00	0.66	0.48	0.00	1.00	0.63	0.48	0.00	1.00	0.71	0.46	0.00	1.00
Skewness	0.20	0.99	-2.28	4.02	-0.29	0.77	-2.67	2.97	-0.17	0.93	-3.61	6.57	-0.31	0.69	-2.06	1.32
Kurtosis	1.67	3.86	-1.09	21.54	2.13	3.84	-0.65	27.19	2.00	5.00	-1.11	58.17	1.18	1.76	-0.83	7.36
Std. Dev. of r	3.24	1.51	0.74	6.45	1.54	0.91	0.03	4.70	3.17	2.09	0.44	17.66	2.02	1.82	0.30	8.64
AVG r	0.24	0.54	-1.23	1.68	0.28	0.34	-0.80	2.57	0.29	0.52	-2.12	1.49	0.01	0.49	-1.64	1.05
Age [yrs]	5.22	4.61	1.10	20.60	4.95	2.55	1.20	13.50	5.23	3.75	1.10	21.90	3.40	2.79	1.20	13.10
AVG AuM	90.81	141.88	1.00	832.46	455.24	675.74	1.00	3122.68	152.77	315.38	1.00	3728.08	166.26	290.07	1.00	1587.41
MED AuM	75.92	127.69	0.00	826.00	446.48	662.16	0.00	3340.00	145.50	314.94	0.00	3623.00	154.90	282.49	0.00	1563.00

Note: The Dead/Alive: denotes the percentage of AIFs, which have not reported any results in Oct 2016. The Negative Skew %: percentage of AIFs with negative skewness. Skewness and Kurtosis: the average skew/kurt value for a given strategy. Std. Dev. of r: standard deviation of the returns. The AVG r: average returns. The Age [yrs]: the average age of AIFs for a given strategy. While the AVG and MED AuM: average and median assets under management in $US millions.

Table 4: Non-Parametric Performance Persistence

Panel A

Domicile		WW	LL	WL	LW	WG	LG	NEW	NEL
USA	Mean	171.43	170.07	149.92	149.23	4.22	6.16	4.41	4.03
	Total	44572	44218	38979	38801	586	875	975	878
CAYI	Mean	155.62	152.53	126.65	126.19	4.01	6.14	4.23	4.74
	Total	40462	39657	32928	32810	557	970	934	1009
LUX	Mean	57.09	56.77	50.66	50.62	2.75	2.86	3.01	3.72
	Total	14216	13852	12411	12452	151	206	352	499
IRL	Mean	25.85	24.89	23.07	23.18	1.55	1.68	1.63	2.18
	Total	6694	6396	5930	5956	68	126	165	261

Panel B

Investment Strategy		WW	LL	WL	LW	WG	LG	NEW	NEL
LSE	Mean	147.12	143.96	123.45	123.16	3.72	5.71	4.29	4.84
	Total	38250	37429	32097	32021	514	890	919	1026
CTA	Mean	94.34	92.85	88.99	88.70	3.07	3.85	3.07	3.08
	Total	24528	24142	23138	23062	362	500	577	569
FIX	Mean	72.02	70.84	49.67	49.89	2.35	2.60	2.42	3.38
	Total	18652	18206	12764	12822	167	268	336	571
MLTI	Mean	45.20	44.10	36.07	36.01	2.18	2.31	1.82	2.09
	Total	11753	11465	9379	9362	172	238	264	287

Note: This table presents the mean and total number of winning [WW] and losing [LL] periods over the 262 months between Jan 1995 and Oct 2016. Furthermore, it also provides the number of winners-gone [WG] and losers-gone [LG] as well as the new-entrant-winner [NEW] and new-entrant-loser [NEL].

Table 5: Non-parametric Performance Persistence

Panel A

Domicile	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]
USA	1.79/1.30	196	1.64/26.96	126 [112]	24.99/727.68	181 [159]	165 [0.63]
CAYI	1.95/1.49	190	2.16/37.58	123 [102]	22.96/1417.15	160 [135]	195 [0.74]
LUX	2.68/1.27	213	0.90/13.91	79 [66]	12.05/193.78	127 [99]	159 [0.61]
IRL	3.27/1.21	213	0.57/7.59	63 [39]	6.76/57.72	109 [64]	161 [0.61]

Panel B

Investment Strategy	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]
LSE	2.00/1.39	194	1.78/30.87	115 [102]	23.39/955.35	167 [143]	173 [0.66]
CTA	1.68/1.11	190	0.48/8.01	97 [77]	14.97/64.23	159 [130]	138 [0.53]
FIX	3.19/2.07	224	2.5/44.85	136 [115]	20.22/2033.83	160 [134]	198 [0.76]
MLTI	2.54/1.53	200	1.31/21.81	100 [78]	8.54/477.32	126 [96]	179 [0.68]

Note: This table provides the results of the non-parametric test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first column shows the average and total CPR, the second column shows the number of months different from CPR's null hypothesis, the third column shows the average and total Z-stat, the fourth column counts the number of months where Z-stat is sig. at 5 and 1%, the following column shows the average and total X^2 figures and the sixth column counts the number of significant cases. Lastly, PRW shows the number and percentage of AIFs considered repeating winners.

Table 6. Non-parametric Performance Persistence: Domicile Combined with the Investment Strategy

Panel A

United States		**WW**	**LL**	**WL**	**LW**	**WG**	**LG**	**NEW**	**NEL**
USA_LSE	Mean	103.40	101.70	89.18	88.67	2.77	4.18	3.13	2.60
	Total	26883	26442	23187	23054	338	552	589	507
USA_CTA	Mean	64.34	63.63	60.35	60.10	2.31	2.92	2.38	2.22
	Total	16728	16543	15690	15625	236	333	391	344
USA_FIX	Mean	16.31	15.69	11.08	11.04	1.45	1.55	1.24	1.40
	Total	4224	4016	2815	2804	45	87	82	101
USA_MLTI	Mean	16.70	16.08	13.09	13.07	1.54	1.21	1.23	1.17
	Total	4342	4180	3404	3397	60	70	74	82

Panel B

Cayman Islands		**WW**	**LL**	**WL**	**LW**	**WG**	**LG**	**NEW**	**NEL**
CAYI_LSE	Mean	100.30	98.23	82.60	82.30	2.88	4.14	3.15	3.44
	Total	26078	25539	21477	21398	374	637	623	637
CAYI_CTA	Mean	20.02	19.19	18.95	18.91	1.44	1.53	1.43	1.41
	Total	5204	4969	4928	4916	82	112	130	121
CAYI_FIX	Mean	20.33	19.55	13.60	13.55	1.22	1.77	1.23	1.54
	Total	4941	4654	3182	3184	44	113	87	143
CAYI_MLTI	Mean	21.97	21.18	17.80	17.63	1.53	1.64	1.38	1.50
	Total	5668	5444	4467	4442	81	131	138	126

Panel C

Luxembourg		**WW**	**LL**	**WL**	**LW**	**WG**	**LG**	**NEW**	**NEL**
LUX_LSE	Mean	19.99	21.85	20.72	20.55	1.57	1.91	1.98	1.88
	Total	4098	3911	3585	3576	47	86	131	145
LUX_CTA	Mean	7.15	7.64	7.50	7.49	1.36	1.30	1.41	1.36
	Total	1794	1613	1709	1707	30	35	48	57
LUX_FIX	Mean	28.67	31.18	25.18	24.91	1.81	1.91	2.32	2.38
	Total	7282	6922	5641	5680	47	61	137	233
LUX_MLTI	Mean	7.01	10.55	10.53	10.64	1.93	1.38	1.63	1.55
	Total	1479	1319	1306	1309	29	22	49	51

Panel D

Ireland		**WW**	**LL**	**WL**	**LW**	**WG**	**LG**	**NEW**	**NEL**
IRL_LSE	Mean	14.27	14.16	12.54	12.52	1.31	1.40	1.38	1.64
	Total	3583	3369	3136	3143	38	67	90	126
IRL_CTA	Mean	3.58	3.17	3.52	3.49	1.00	1.33	1.09	1.15
	Total	917	767	883	877	18	16	25	30
IRL_FIX	Mean	11.16	10.85	10.66	11.00	1.25	1.21	1.37	1.66
	Total	1942	1790	1673	1694	15	23	41	83
IRL_MLTI	Mean	1.82	2.02	2.08	2.06	1.25	1.09	1.25	1.31
	Total	4098	3911	3585	3576	47	86	131	145

Note: This table presents the mean and total number of winning [WW] and losing [LL] periods over the 262 months between Jan 1995 and Oct 2016. Furthermore, it also provides the number of winners-gone [WG] and losers-gone [LG] as well as the new-entrant-winner [NEW] and new-entrant-loser [NEL].

Table 7: Non-parametric Performance Persistence: Domicile combined with the Investment Strategy

Panel A

USA	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]	PRW %
USA_LSE	2.02/1.33	200	1.36/22.43	116 [105]	18.7/503.79	171 [147]	171	0.65
USA_CTA	1.61/1.13	191	0.45/7.69	82 [65]	9.26/59.21	134 [99]	146	0.56
USA_FIX	3.93/2.15	224	1.30/22.11	79 [45]	4.57/494.73	101 [55]	204	0.78
USA_MLTI	2.77/1.57	212	0.83/13.86	70 [41]	3.77/192.95	89 [54]	173	0.66

Panel B

Cayman Island	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]	PRW %
CAYI_LSE	2.29/1.45	194	1.61/28.39	114 [94]	16.23/808.27	151 [122]	174	0.66
CAYI _CTA	1.70/1.07	212	0.15/2.31	44 [26]	4.15/5.32	86 [52]	138	0.53
CAYI _FIX	3.73/2.27	221	1.58/25.35	93 [58]	5.81/651.58	105 [67]	200	0.76
CAYI_MLTI	2.53/1.56	202	.91/15.52	72 [45]	4.5/241.92	93 [55]	171	0.65

Panel C

Luxemburg	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]	PRW %
LUX_LSE	2.57/1.25	216	0.49/6.864	30 [20]	4.15/47.16	45 [31]	129	0.49
LUX_CTA	3.36/0.99	233	0.05/-.167	26 [18]	3.75/0.03	72 [39]	128	0.49
LUX_FIX	3.35/1.57	229	1.14/17.98	72 [59]	11.02/324.63	113 [91]	177	0.68
LUX_MLTI	3.03/1.14	238	0.1/2.42	23 [13]	4.91/5.88	54 [31]	149	0.57

Panel D

Ireland	Mean/Total CPR	CPR	Mean/Total Z-s	Z@5% [1%]	Mean/Total X2	X2@5% [@1%]	PRW [PRW%]	PRW %
IRL_LSE	3.25/1.22	213	0.43/5.82	46 [27]	4.19/33.9	80 [55]	139	0.53
IRL_CTA	2.57/0.91	217	-0.06/-1.41	6 [1]	1.85/1.98	40 [10]	104	0.40
IRL_FIX	3.97/1.23	232	0.36/4.294	25 [14]	4.82/18.46	58 [37]	110	0.42
IRL_MLTI	2.42/1.30	241	0.09/2.21	1 [0]	1.82/4.9	16 [1]	143	0.55

Note: This table provides the results of the non-parametric test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first column shows the average and total CPR, the second column shows the number of months different from CPR's null hypothesis, the third column shows the average and total Z-stat, the fourth column counts the number of months where Z-stat is sig. at 5 and 1%, the following column shows the average and total X^2 figures and the sixth column counts the number of significant cases. Lastly, PRW shows the number and percentage of AIFs considered repeating winners.

Table 8. Parametric Performance Persistence [non-risk-adjusted [XR]]

Panel A

^{XR}Domicile	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-2.228	-1.616	-1.923	-1.823	3.520	1.500	2.978	2.090	0.079	0.273	0.191	0.250	0.176	0.299	0.223	0.153	0.474	0.439	0.401	0.413
Sigma	2.637	1.659	2.121	1.572	3.335	1.508	2.646	1.587	1.297	0.961	0.455	0.653	0.444	0.588	0.454	0.673	0.155	0.163	0.200	0.215
Max	29.432	5.794	4.385	3.131	59.368	9.708	47.553	8.358	3.695	11.786	6.634	4.827	3.806	2.612	4.313	5.391	0.996	0.996	0.985	0.962
Min	-27.820	-10.925	-18.056	-11.405	-17.032	-2.404	-5.586	-2.927	-50.693	-9.922	-2.078	-5.449	-8.119	-2.704	-3.232	-2.763	-0.502	-1.097	-0.719	-0.776
Positive	168	51	190	18	2280	811	2015	405	1378	563	1387	294	1599	619	1484	268				
Sig @ 0.05									1183	440	1156	240	1284	537	1204	229				
Negative	2134	802	1844	412	22	42	19	25	924	290	647	136	703	234	550	162				
Sig @ 0.05									858	269	603	124	681	225	534	156				

Panel B

^{XR}InvStra	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	LSE	FIX	MLTI
Mean	-2.702	-2.134	-0.895	-1.523	3.902	3.074	1.312	2.492	0.118	0.145	0.271	0.169	0.201	0.185	0.312	0.193	0.471	0.430	0.445	0.418
Sigma	2.925	2.014	1.746	1.844	3.849	2.237	2.158	3.018	1.521	0.460	1.344	0.608	0.480	0.444	0.624	0.514	0.163	0.204	0.161	0.189
Max	28.085	4.385	29.432	5.794	59.368	26.817	47.553	39.250	3.695	6.634	11.786	2.750	3.796	5.391	4.554	3.063	0.992	0.996	0.959	0.961
Min	-27.820	-22.413	-16.007	-14.149	-17.032	-5.586	-2.927	-2.109	-50.693	-9.922	-30.356	-6.445	-8.119	-3.088	-2.704	-3.232	-0.324	-0.336	-0.776	-1.097
Positive	47	172	142	66	1198	2901	864	548	780	1840	630	372	853	2063	663	391				
Sig @ 0.05									665	1559	479	316	706	1733	500	315				
Negative	1165	2756	770	501	14	27	48	19	432	1088	282	195	359	865	249	176				
Sig @ 0.05									402	1019	256	177	342	840	242	172				

Note: This table provides the results of the parametric (XR) test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first two columns refer to the dummy variables which separate negative (Alpha n) and positive (Alpha p) cases, the third column (Beta n) implies the existence of the auto-correlation or persistence of the negative (losing) cases, while the fourth column (Beta n) implies the auto-correlation or persistence amongst positive (winning) cases, the last column provides the adjusted r-squared figures.

Table 9: Parametric Performance Persistence [non-risk-adjusted [XR]]

Panel A

XR LSE	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-2.230	-2.237	-1.993	-2.317	3.412	2.153	3.032	2.683	0.101	0.052	0.196	0.200	0.141	0.226	0.229	0.112	0.4663	0.4243	0.4547	0.4451
Sigma	2.106	1.722	2.030	1.678	2.380	1.636	2.246	1.536	0.352	0.755	0.439	0.537	0.385	0.395	0.461	0.623	0.1459	0.1497	0.1989	0.2217
Max	3.830	0.175	4.385	0.461	25.387	9.708	26.817	8.358	3.003	1.867	6.634	4.827	3.806	1.568	4.313	5.391	0.9592	0.9207	0.9159	0.9135
Min	-22.413	-9.583	-18.056	-11.405	-2.584	-0.988	-5.586	-0.135	-1.763	-9.922	-1.359	-0.974	-3.088	-0.846	-2.191	-2.763	-0.5019	-0.3477	-0.7193	-0.7762
Positive	60	3	103	6	1152	273	1260	216	675	149	870	146	792	197	937	137				
Sig @ 0.05									579	130	730	120	654	178	783	118				
Negative	1099	273	1172	212	7	3	15	2	484	127	405	72	367	79	338	81				
Sig @ 0.05									450	115	387	67	358	77	329	76				

Panel B

XR CTA	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-2.824	-2.556	-2.589	-1.805	4.353	2.563	3.474	2.122	0.055	0.328	0.204	0.201	0.171	0.357	0.206	0.296	0.4885	0.4616	0.4051	0.3998
Sigma	3.205	2.267	2.448	1.364	4.359	2.107	2.635	1.512	1.856	0.535	0.377	0.517	0.499	0.572	0.372	0.399	0.1497	0.1613	0.2040	0.1979
Max	28.085	0.385	4.368	0.251	59.368	9.692	15.960	5.425	3.695	1.780	1.642	1.848	3.796	2.523	1.687	1.140	0.992	0.9741	0.8993	0.9616
Min	-27.820	-10.925	-17.694	-6.836	-17.032	-2.404	0.040	-2.281	-50.693	-1.511	-0.858	-1.208	-8.119	-0.694	-0.980	-0.536	-0.3235	-0.1266	-0.2523	-0.1783
Positive	25	7	11	4	780	102	262	54	485	81	178	36	542	80	187	44				
Sig @ 0.05									419	61	155	30	447	67	157	35				
Negative	762	99	251	53	7	4	0	3	302	25	84	21	245	26	75	13				
Sig @ 0.05									279	24	80	19	233	25	71	13				

Panel C

XR FIX	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-0.485	-0.983	-1.006	-1.042	1.390	0.829	2.073	1.228	0.007	0.438	0.217	0.269	0.379	0.345	0.275	0.181	0.5036	0.4940	0.3718	0.3767
Sigma	2.539	1.050	2.107	0.916	1.540	0.737	3.734	1.178	2.296	1.118	0.613	0.837	0.482	0.688	0.470	0.813	0.2130	0.1917	0.1927	0.1696
Max	29.432	3.720	1.397	3.131	13.919	4.268	47.553	6.311	2.248	11.786	4.381	2.077	2.282	2.612	1.962	4.554	0.9964	0.9961	0.9845	0.816
Min	-9.374	-5.487	-16.007	-3.962	-0.906	-0.701	-1.053	-2.927	-30.356	-3.965	-1.390	-5.449	-1.081	-2.704	-1.728	-2.168	0.0364	0.0281	-0.3359	-0.2714
Positive	56	37	44	5	183	343	227	111	111	266	166	87	151	272	170	70				
Sig @ 0.05									88	189	129	73	94	228	117	61				
Negative	131	334	186	119	4	28	3	13	76	105	64	37	36	99	60	54				
Sig @ 0.05									71	99	53	33	36	93	60	53				

Panel D

XR MTLI	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-1.371	-1.253	-1.722	-1.508	2.731	1.063	3.013	1.314	0.120	0.212	0.132	0.618	0.215	0.265	0.166	0.072	0.4885	0.4616	0.4051	0.3998
Sigma	1.895	1.459	1.916	1.859	3.545	1.030	3.077	1.599	0.405	1.054	0.435	0.651	0.445	0.621	0.471	0.743	0.1497	0.1613	0.2040	0.1979
Max	1.966	5.794	0.723	0.897	39.250	5.000	33.105	7.424	2.117	2.750	2.232	1.834	3.063	1.749	2.284	2.952	0.939	0.9223	0.8825	0.9612
Min	-14.149	-7.224	-11.945	-8.067	-2.109	-1.960	-0.178	-1.112	-1.382	-6.445	-2.078	-0.626	-1.166	-2.686	-3.232	-1.227	0.0762	-1.0972	-0.2233	-0.2513
Positive	27	4	32	3	165	93	266	24	107	67	173	25	114	70	190	17				
Sig @ 0.05									97	60	142	17	89	64	147	15				
Negative	142	96	235	28	4	7	1	7	62	33	94	6	55	30	77	14				
Sig @ 0.05									58	31	83	5	54	30	74	14				

Note: This table provides the results of the parametric (XR) test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first two columns refer to the dummy variables which separate negative (Alpha n) and positive (Alpha p) cases, the third column (Beta n) implies the existence of the auto-correlation or persistence of the negative (losing) cases, while the fourth column (Beta n) implies the auto-correlation or persistence amongst positive (winning) cases, the last column provides the adjusted r-squared figures.

Table 10: Parametric Performance Persistence [risk-adjusted [AXR]]

Panel A

AXR Domicile	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-2.328	-1.654	-1.916	-1.819	3.691	3.027	3.097	2.252	0.006	0.015	0.007	0.037	0.008	8.532	-0.006	0.056	0.456	0.415	0.365	0.387
Sigma	2.478	1.577	2.319	1.539	4.266	45.113	2.658	2.175	0.451	0.321	0.405	0.929	0.829	249.296	0.369	0.606	0.169	0.178	0.218	0.226
Max	7.325	3.184	35.118	1.617	132.712	1317.945	51.408	30.967	7.586	4.587	13.641	18.300	27.972	7285.249	3.173	9.722	0.995	0.999	0.981	0.884
Min	-32.997	-9.999	-28.547	-9.176	-6.409	-48.429	-4.704	-5.236	-8.467	-3.180	-3.004	-2.741	-22.605	-4.105	-9.992	-1.638	-1.139	-0.910	-1.032	-0.934
Positive	191	60	205	26	2295	832	2018	413	1172	450	1034	205	1217	441	1060	238				
Sig @ 0.05									1114	427	980	197	1145	417	1003	230				
Negative	2111	793	1829	404	7	21	16	17	1130	403	1000	225	1085	412	974	192				
Sig @ 0.05									1084	378	969	210	1029	395	922	183				

Panel B

AXR InvStra	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	FIX	LSE	MLTI	CTA	LSE	FIX	MLTI
Mean	-2.820	-2.149	-0.929	-1.572	4.111	3.187	1.408	4.845	0.008	0.010	0.010	0.017	-0.024	0.014	-0.007	12.879	0.454	0.386	0.425	0.394
Sigma	2.675	2.167	1.516	1.897	5.418	2.297	2.899	55.255	0.709	0.406	0.376	0.272	0.783	0.349	0.241	305.683	0.176	0.220	0.179	0.190
Max	1.296	35.118	7.325	2.022	132.712	30.967	51.408	1317.945	18.300	13.641	4.587	3.197	3.254	9.722	2.542	7285.249	0.979	0.999	0.989	0.942
Min	-32.997	-23.006	-28.547	-15.357	-1.856	-5.236	-48.429	-6.409	-5.316	-4.511	-8.467	-2.741	-22.605	-2.968	-4.105	-9.992	-0.856	-0.480	-1.139	-1.032
Positive	46	186	174	76	1200	2905	897	556	597	1496	480	288	619	1543	495	299				
Sig @ 0.05									568	1419	456	275	578	1464	470	283				
Negative	1166	2742	738	491	12	23	15	11	615	1432	432	279	593	1385	417	268				
Sig @ 0.05									593	1378	402	268	555	1326	399	249				

Note: This table provides the results of the parametric (AXR) test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first two columns refer to the dummy variables which separate negative (Alpha n) and positive (Alpha p) cases, the third column (Beta n) implies the existence of the auto-correlation or persistence of the negative (losing) cases, while the fourth column (Beta n) implies the auto-correlation or persistence amongst positive (winning) cases, the last column provides the adjusted r-squared figures.

Table 11: Parametric Performance Persistence [risk-adjusted [AXR]]: Domicile combined with the Investment Strategy

Panel A

^{AXR}**LSE**	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL
Mean	-2.289	-2.251	-1.979	-2.270	3.517	2.233	3.150	2.859	0.013	0.021	0.008	-0.015	0.010	-0.004	0.000	0.131	0.4480	0.4009	0.4329	0.4361
Sigma	2.184	1.724	2.307	1.595	2.345	1.672	2.244	2.606	0.339	0.332	0.482	0.319	0.246	0.300	0.295	0.819	0.1648	0.1720	0.2100	0.2262
Max	2.480	3.184	35.118	0.599	24.691	9.893	28.275	30.967	4.585	1.377	13.641	2.052	2.152	2.814	3.173	9.722	0.9757	0.9893	0.8102	0.8476
Min	-23.006	-9.811	-14.825	-9.176	-0.492	-0.163	-4.704	-5.236	-4.511	-3.026	-3.004	-2.240	-2.968	-2.595	-2.418	-1.385	-1.1393	-0.9098	-0.67	-0.9338
Positive	71	3	105	7	1156	275	1262	212	606	138	653	99	610	154	660	119				
Sig @ 0.05									576	132	615	96	582	148	622	112				
Negative	1088	273	1170	211	3	1	13	6	553	138	622	119	549	122	615	99				
Sig @ 0.05									530	130	606	112	528	115	586	97				

Panel B

^{AXR}**CTA**	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	CAYI	LUX	IRL
Mean	-3.004	-2.514	-2.596	-1.878	4.642	2.627	3.483	2.420	-0.003	-0.037	-0.015	0.344	-0.031	-0.027	-0.013	0.021	0.4778	0.433	0.3762	0.3588
Sigma	2.871	2.166	2.358	1.522	6.435	2.107	2.523	1.498	0.544	0.409	0.280	2.408	0.955	0.231	0.243	0.289	0.1598	0.1824	0.2015	0.2200
Max	1.296	0.739	1.015	0.249	132.712	9.926	17.438	6.104	7.586	0.543	1.913	18.300	3.254	0.671	0.930	0.837	0.979	0.9099	0.8594	0.7965
Min	-32.997	-9.999	-19.167	-8.246	-1.856	-0.925	-0.380	-0.178	-5.316	-3.180	-1.675	-0.819	-22.605	-1.052	-1.911	-1.638	-0.856	-0.3238	-0.3438	-0.4089
Positive	24	6	12	4	784	99	261	56	373	60	131	33	411	45	129	34				
Sig @ 0.05									350	56	129	33	381	41	123	33				
Negative	763	100	250	53	3	7	1	1	414	46	131	24	376	61	133	23				
Sig @ 0.05									400	42	127	24	344	60	130	21				

Panel C

^{AXR}**FIX**	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL
Mean	-0.525	-1.041	-0.999	-1.076	1.731	0.696	2.343	1.318	-0.033	0.027	0.019	0.009	0.006	-0.013	0.005	-0.028	0.4629	0.4608	0.3210	0.3282
Sigma	1.254	0.943	2.410	0.887	1.565	2.894	3.940	0.983	0.670	0.314	0.146	0.154	0.092	0.314	0.227	0.144	0.2267	0.2042	0.2093	0.1854
Max	7.325	1.717	0.860	0.246	15.336	6.969	51.408	5.604	2.866	4.587	0.989	0.630	0.469	2.542	0.677	0.451	0.9945	0.9986	0.9809	0.8626
Min	-5.234	-5.591	-28.547	-4.123	0.170	-48.429	0.244	-0.903	-8.467	-1.113	-0.477	-0.878	-0.361	-4.105	-2.740	-0.988	-0.1544	-0.0015	-0.4795	-0.3878
Positive	64	45	53	12	187	358	230	122	107	199	114	60	102	189	132	72				
Sig @ 0.05									105	187	108	56	95	177	126	72				
Negative	123	326	177	112	0	13	0	2	80	172	116	64	85	182	98	52				
Sig @ 0.05									74	162	109	57	83	176	90	50				

Panel D

^{AXR}**MLTI**	α_n				α_p				β_n				β_p				$Adj\ R^2$			
	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL	USA	LUX	CAYI	IRL
Mean	-1.446	-1.367	-1.735	-1.507	2.625	14.290	3.110	1.416	0.043	0.008	0.012	-0.051	0.171	72.868	-0.042	-0.075	0.3996	0.4243	0.3278	0.3214
Sigma	2.078	1.226	1.963	1.949	2.206	131.025	3.082	1.739	0.324	0.164	0.211	0.545	2.155	724.872	0.720	0.242	0.1508	0.1689	0.2347	0.2953
Max	2.022	0.230	0.604	1.617	18.490	1317.945	30.573	7.901	3.197	0.541	2.065	0.907	27.972	7285.249	2.165	0.213	0.9395	0.942	0.7758	0.8841
Min	-15.048	-7.140	-15.357	-8.425	-6.409	0.030	-0.328	-0.402	-1.137	-0.803	-0.570	-2.741	-1.249	-0.415	-9.992	-1.255	-0.2138	-0.4795	-1.0316	-0.3697
Positive	32	6	35	3	168	100	265	23	86	53	136	13	94	53	139	13				
Sig @ 0.05									83	52	128	12	87	51	132	13				
Negative	137	94	232	28	1	0	2	8	83	47	131	18	75	47	128	18				
Sig @ 0.05									80	44	127	17	74	44	116	15				

Note: This table provides the results of the parametric (AXR) test for a collective sample of 5619 AIFs from January 1995 to October 2016 [monthly intervals]. The first two columns refer to the dummy variables which separate negative (Alpha n) and positive (Alpha p) cases, the third column (Beta n) implies the existence of the auto-correlation or persistence of the negative (losing) cases, while the fourth column (Beta n) implies the auto-correlation or persistence amongst positive (winning) cases, the last column provides the adjusted r-squared figures.

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