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Adaptive Strategies: Hedge Fund and Mutual Fund Performance in the Context of Emerging Markets

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Master in Finance

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Abstract

When looking for opportunities, investors who are willing to take on more risk are likely to look to emerging markets, which are renowned for their quick economic expansion but also for their increased volatility. Based on their performance, particularly for these markets, from 2015 to 2024, the study aims to evaluate the efficacy of adaptive strategies used by mutual funds and hedge funds. It is anticipated that the study will give fund managers important new information. A number of performance metrics, tactics, and empirical studies that address the complexities of certain funds are included in the literature review. In terms of strategy, hedge funds use more adaptable techniques like market neutrality and arbitrage, which allow them to take advantage of market inefficiencies (also a lack of regulation). Conversely, mutual funds are better suited for family-safe investments because they are more regulated and have less leverage. As a result, fund managers avoid making high-risk decisions and primarily employ passive strategies. The nations chosen to be examined in this study are Saudi Arabia, Indonesia, and China. The information was also obtained from various databases. The study suggests three scenarios that will be examined: mutual funds and hedge funds both have improved their strategies over time, but hedge funds perform better because of their more adaptable strategies. It's interesting to note that whether political and economic developments have a big influence on these funds' performance will be discussed. Given the complexity of hedge funds, this study aims to close some of the gaps and offer suggestions for improving fund performance.

Keywords: Emerging Markets – Hedge Funds – Mutual Funds – Strategies

JEL classification: G23; G110; G150

Resumo

Quando procuram oportunidades, os investidores que estão dispostos a assumir mais riscos tendem a olhar para os mercados emergentes, conhecidos pela sua rápida expansão económica, mas também pela sua maior volatilidade. Com base no seu desempenho, particularmente nestes mercados, de 2015 a 2024, o estudo pretende avaliar a eficácia das estratégias adaptativas utilizadas por fundos mútuos e fundos de cobertura. Prevê-se que o estudo forneça informações novas e relevantes aos gestores de fundos. A revisão da literatura inclui vários indicadores de desempenho, táticas e estudos empíricos que abordam as complexidades de determinados fundos. Em termos de estratégia, os fundos de cobertura utilizam técnicas mais adaptáveis, como neutralidade de mercado e arbitragem, que lhes permitem tirar partido das ineficiências do mercado (também da falta de regulação). Por outro lado, os fundos mútuos são mais adequados para investimentos seguros para famílias, uma vez que são mais regulados e utilizam menos alavancagem. Como resultado, os gestores de fundos evitam tomar decisões de alto risco e empregam principalmente estratégias passivas. Os países escolhidos para análise neste estudo são a Arábia Saudita, a Indonésia e a China. A informação foi também obtida a partir de várias bases de dados. O estudo propõe três cenários a serem examinados: os fundos mútuos e os fundos de cobertura melhoraram ambos as suas estratégias ao longo do tempo, mas os fundos de cobertura apresentam um desempenho superior devido às suas estratégias mais adaptáveis. É interessante notar que será discutido se os desenvolvimentos políticos e económicos têm uma grande influência no desempenho destes fundos. Dada a complexidade dos fundos de cobertura, este estudo pretende colmatar algumas lacunas e apresentar sugestões para melhorar o desempenho dos fundos.

Palavras-chave: Mercados Emergentes – Hedge Funds – Fundos Mútuos – Estratégias

Classificação JEL: G23; G110; G150

Glossary

- ❖ AUM – Assets Under Management
- ❖ CAPM – Capital Asset Pricing Model
- ❖ ETF – Exchange-Traded Fund
- ❖ FTSE – Financial Times Stock Exchange
- ❖ HML – High Minus Low
- ❖ IPO – Initial Public Offering
- ❖ NAV – Net Asset Value
- ❖ SMB – Small Minus Big
- ❖ UIT – Unit Investment Trust
- ❖ YTD – Year to Date
- ❖ S&P – Standard & Poor's

Table of Contents

Introduction	1
1. Literature Review.....	5
1.1 History of emerging markets and their macroeconomic factors	5
1.2 What Does Behavioral Finance Reveal About Emerging Markets?.....	7
1.3 Exposing How Political and Sovereign Instability Affect Fund Strategies in Emerging Markets	8
1.4 How Will AI Affect Funds in Emerging Markets?	9
1.5 Decoding Hedge Fund Performance: From Metrics to Mastery	10
1.6 Managing Mutual Fund Performance: The Important Metrics	11
1.7 Strategic Insights: Exploring the Empirical Performance of Hedge Funds	13
1.8 Mutual Fund Structures and Strategies: A Deep Dive into Investment Dynamics	14
1.9 Hedge Funds vs. Mutual Funds: A Comparative Study of Risk and Performance	14
2. Methodology	17
2.1 Descriptive Statistics.....	17
2.2 Performance Ratios.....	17
2.3 Model	18
3. Empirical Findings	23
4. Discussion	27
Conclusion	31
References	33
Appendixes	37
.....	37

List of Tables

Table 1. Performance of Hedge Funds and Mutual Funds Across Regions and Strategies	23
Table 2. Hedge Funds Random-effects GLS regression	37
Table 3. Mutual Funds Random-effects GLS regression	38
Table 4. Hausman test for hedge funds and mutual funds.....	39

Introduction

As mentioned above, emerging markets are associated with rapid economic growth, and the main causes for this event are a shift in industrialization and the middle class. This is why often economics name them as the drivers of global economic expansion. However, they present some challenges such as their political instability and high volatility. Asset management companies that seek greater exposure to risk tend to allocate client's assets throughout the different countries constituent of the emerging markets. This type of market has become increasingly attractive to fund managers over the past decade, driven by promising growth prospects and diversification benefits (Kearney, 2012). Hedge funds often use excessive leveraging, short-selling, and derivatives, which gives a greater risk (Lambert, 2012). Since they are actively managed¹, they can hedge the risk and make huge profits. In contrast, mutual funds typically adopt more conservative and long-term strategies, adhering to strict regulatory guidelines, potentially limiting their adaptability to swiftly respond to market changes (Elton et al., 1996).

The main goal of this study is to evaluate the strategies that yield the best performance for hedge funds and mutual funds in China, Indonesia, and Saudi Arabia. In these ten years, it is going to be identified which strategies are the most effective in adapting to the special conditions of emerging markets. The second goal is to discuss why certain strategies outperform others (i.e., adapt better) in each country and also in a general view of emerging markets as a whole. The discussion might consider economic, political, and other relevant factors that may contribute to the funds' performance.

The study includes a performance evaluation that includes descriptive statistics and risk-adjusted performance measures. It incorporates the mean, median, volatility, skewness, kurtosis, and annual returns which are used to profile each fund's risk-return characteristics. On the other hand, the measures take into account Adjusted Sharpe Ratio (skewness and kurtosis); Sortino Ratio (downside risk); and the Treynor Ratio (returns relative to market risk).

¹ extremely high fees

Additionally, the study develops a multi-factor performance model to calculate Jensen's Alpha, with the support of the Fama-French Five-Factor Model plus a momentum component. The extension of the model accounts for size, value, profitability, investment aggressiveness, and momentum, offering a detailed perspective of the performances. The data was collected annually from the Kenneth R. French Data Library. The sample size is small (33 funds per type), nonetheless a random effects panel regression is employed, and assessed its veracity by using the Hausman test. Hence, this model accounts for fund variation and ensures more robustness (statistically significant estimates of alpha and other coefficients).

The benchmark used to cover the relevant regions is the MSCI Emerging Markets Index, while the risk-free rates are derived from 10-year government bond yields in China, Indonesia, and Saudi Arabia. Lastly, it is considered a composite score to evaluate each strategy, being possible to rank overall performance. This score considers different indicators with different weights: annualized returns, volatility, adjusted Sharpe Ratio, Sortino Ratio, and Treynor Ratio. Theoretical and practical considerations were used to structure the weighting which focus more on total return by penalizing excessive risk, and integrating both absolute and risk-adjusted performance dimensions (Bacon, 2010).

Fund managers and individual investors should understand the strengths and limitations of each strategy as it is essential for achieving success in these markets. Therefore, the insights provided throughout the paper will serve investors to make informed decisions when allocating capital to these high-risk high-rewards markets.

Going one by one, investors can benefit from the analysis that evaluates fund performance over the past decade in these three countries, which in turn, alerts them of future investment decisions, particularly in terms of risk management and strategy approach. Hence, the findings provide both seasoned and new investors with a clear view of which have been the most effective strategies in volatile markets. The results can elucidate fund managers in a broader landscape about fund performance, advising them about future decision-making, so they can adjust the management (e.g., expenses calculated as a percentage of AUM) accordingly to market conditions. Lastly, aiming to foster more stable and efficient capital markets², policymakers can

² limiting hedge fund leverage and margin calls

acquire an understanding of regulatory complexities faced by these funds (mostly hedge funds), perhaps political instability leads to gaps in legislation (in the discussion it may appear articles/news about this situation).

Regarding the format of this thesis, the idea is to make a dissertation rather than a master's project as it is projected to do a comprehensive and rigorous analysis of strategic adaptability and performance for hedge funds and mutual funds. Moreover, it will cover multiple years and incorporate advanced descriptive statistics and performance indicators. The scope involves literature review, hypothesis testing, and sophisticated models. Nonetheless, it requires extensive data collection from specialized databases for the funds and also for two benchmarks to allow comparative analysis. So, the depth of research intended to be embraced in this study alongside a significant contribution to the field, align more closely with the expectations and academic rigor of a dissertation.

1. Literature Review

Managed funds are among the most important instruments for driving personal wealth, so defining their investment strategies is essential. This thesis examines the performance of these funds in different regions to assess their behaviour in each environment, analysing to what extent they are efficient and whether there will be room for growth opportunities in the future.

Macroeconomic factors are the first topic seen in the literature review to understand why they are unique in these markets. Additionally, it is reviewed the investor behaviour that is influenced by these markets, and fund performance together with metrics and strategies. Lastly, minor topics will be assessed, for instance, political instability, sovereign risks, and the impact of artificial intelligence.

Lastly, the literature was written in a way that enables readers to go through the following sections more smoothly. By encompassing a broader analysis, it reflects a more intuitive approach to guide the complexities of fund performance.

1.1 History of emerging markets and their macroeconomic factors

Macroeconomic factors such as inflation, interest rates, and exchange rates are important in emerging markets as they make funds' performance dependent on them. In these volatile environments, fund managers must conduct active management with adaptive skills. Hedge funds can use high levels of leverage in derivatives and long/short-selling to attenuate macroeconomic uncertainty and turbulence. Scientific articles show that fund managers become anxious during sudden inflation and interest rate changes; they address these challenges by adjusting their portfolios with arbitrage strategies (convertible and merger) to capitalize on market inefficiencies. For instance, when inflation is high, they increase the allocation of assets either to commodities or foreign exchange and reduce exposure to assets sensitive to interest rates like bonds (Brunnermeier and Oehmke, 2013).

Secondly, interest rates should be taken into account while planning strategies to build an effective portfolio. Specifically, when interest rates increase, leverage strategies become less attractive. Furthermore, currency risk is particularly more pronounced in countries with unstable political environments, and therefore may amplify or diminish returns. This is the case where

capital controls³ are used less frequently, causing sudden changes in currency values (Brunnermeier and Oehmke, 2013).

H_1 : The effectiveness of each strategy in increasing fund performance varies significantly across all regions.

On the other hand, mutual fund managers approach macroeconomic changes differently since these funds have broader regulations and are less flexible. Normally, fund managers pursue stock-picking and diversification to mitigate volatility as they have restrictions on limited leverage. Throughout inflationary periods, equities become more attractive to invest in due to their immunity to inflation, as opposed to fixed-income securities. This is when inflation rates decrease, and fund managers seek to invest in bonds to benefit from a potential capital appreciation (Claessens et al, 2003).

Hedge funds capitalize on market inefficiencies and explore arbitrage opportunities that occur during political crises, currency devaluations, or inflation spikes. Discussed by Brunnermeier and Oehmke (2013), fund managers had higher returns while using event-driven and global macro strategies in these periods of uncertainty. Oppositely, mutual funds tend to struggle in performance (especially when weighed in sensitive sectors (Claessens et al., 2003)) because they are suited for long-term investments such as foreign capital inflows. In addition, mutual funds' performance is inhibited by liquidity constraints and regulatory barriers, affecting portfolio optimization. Therefore, it has been used macroeconomic models in fund analysis in order to isolate some drivers, for example, inflation, interest rates, and exchange rates. By doing this, it is possible to identify more resilient strategies during periods of macroeconomic stress (Lambert and Platania, 2020).

Therefore, managers use advanced macroeconomic models in fund analysis to isolate drivers of fund performance, such as inflation, interest rates, and exchange rates. This helps identify more resilient strategies during periods of macroeconomic stress (Lambert and Platania, 2020).

³ It involves government measures to regulate foreign capital flows to manage exchange rates and ensure financial stability

1.2 What Does Behavioral Finance Reveal About Emerging Markets?

Just as investor behavior varies between developed and emerging markets, so do market dynamics. Information asymmetry, which occurs when one investor has more information than others and affects price discovery, is the primary factor influencing investor behavior. This leads to market inefficiencies (Leuz and Verrecchia, 2000). High levels of information asymmetry in emerging markets arise from a lack of financial data, lower levels of financial literacy, and less regulated markets (Barberis and Thaler, 2003). Indeed, all of these factors influence fund performance by originating investor biases such as loss aversion, herd behavior, and overconfidence.

Loss aversion, by definition, is a mentality in which investors would rather avoid losses than experience gains of the same proportion. Investors either held losing positions for too long or sold profitable assets too soon, according to Kahneman and Tversky (1979). Additionally, Kushnir and Кушнір (2015) discovered that these kinds of actions occur in settings where market disturbances are frequent and can result in withdrawals and ineffective long-term returns for both kinds of funds. In contrast to more stable and predictable markets, economic shocks in emerging markets intensify the detrimental effects of loss aversion, resulting in less risky decisions and suboptimal fund performance.

Secondly, herd behavior is present whenever investors mimic others' behavior; this behavior is particularly prevalent in emerging markets, especially due to high uncertainty. Market tendencies often drive investors' behavior more than fundamental analysis, leading to bubbles⁴. This results in a significant correlation between specific events and asset price swings (Ahmad and Wu, 2022). This irrational behavior causes market inefficiencies and frequent asset mispricing. In developed markets, greater transparency reduces abrupt price movements and prevents distorted asset prices.

Finally, Chen et al. (2007) revealed that overconfident investors tend to make more trades, which leads to higher transaction costs, and subsequently, suboptimal timing. In emerging markets, where financial literacy is lower and access to quality data is complicated due to a lack of resources, investors may misinterpret market signals and often overestimate their abilities, attempting to predict price movements. To meet investor demands in these markets, fund managers often take on greater risk. Fund managers frequently react aggressively in the short term to seize perceived opportunities, which leads to inconsistent fund performance (Puetz and Ruenzi, 2011).

⁴ Asset prices soar far above their intrinsic value

1.3 Exposing How Political and Sovereign Instability Affect Fund Strategies in Emerging Markets

Political and sovereign risk are important factors to take into account when making investments in markets such as Saudi Arabia, Indonesia, and China. Sovereign risk pertains to the potential for a country to default on its debt obligations, whereas political risk involves political instability that may impact economic conditions. These markets are more subject to these types of risks due to their weaker governance structures compared to those of developed countries (Proquest.com, 2025).

Since market volatility is positively correlated with sovereign debt crises, the distribution of funds in these regions is determined by a number of decision-making processes. This risk has an impact on market sentiment in addition to bond or debt prices.

More specifically, hedge funds tolerate high-risk strategies and thus tend to use more instruments to hedge against sovereign risk. Specifically, managers opt to use forward and option contracts, avoiding the risk of currency devaluation following a sovereign crisis, and credit default swaps as a form of “insurance” against defaults (Savona and Ciavolino, 2016). On the other hand, mutual funds rely more on diversification to reduce sovereign risk by ensuring assets are spread across various countries and sectors to minimize the impact of a crisis in any particular location (Alsubaiei, Calice, and Vivian, 2021).

Nationalizations and changes in foreign investment regulations can alter the entire risk spectrum for foreign investors (Batten, Gannon, and Thuraishamy, 2017). For instance, in China, the government typically imposes restrictions on capital flows and introduces trade barriers, especially against the USA under President Donald Trump's administration.

Both types of funds need to adjust their strategies to safeguard against political instability. Various events, such as civil unrest or conflicts, can damage the valuation of assets (Tirtiroglu, Bhabra, and Lel, 2004). Hedge funds leverage their flexibility to quickly adjust portfolios in response to political events. They may short-sell to profit from volatility or use options and futures to hedge against it. Their main strategy is to take advantage of political risk by using speculative positions (Aragon and Spencer Martin, 2012).

Mutual fund investors typically build portfolios that are less exposed to political risk because they have a generally lower risk tolerance. For example, they tend to avoid countries that are holding elections and sectors of the economy that are vulnerable to political changes. Mutual

funds also avoid countries with high corruption indices or those with frequent policy changes to protect long-term returns (Chan and Marsh, 2021). Two representative examples from previous studies are the impact of investments during the 1998 Russian financial crisis. Due to the devaluation of the ruble brought on by Russia's debt default, investors in Russian bonds lost money (sovereign risk). Hedge funds that were heavily leveraged in debt instruments experienced massive losses as a result of increased market volatility and a lack of liquidity. For example, in order to avoid systemic risks, LTCM needed a bailout from the US Federal Reserve. Conversely, despite losses, mutual funds with regionally diversified portfolios fared better during the shock. This emphasizes how crucial it is to ensure diversification, review sovereign risk in emerging markets, and exercise caution when using leverage in derivatives (Liang, 2001).

The political risk during the Arab Spring, when anti-government demonstrations expanded throughout the Middle East and North Africa, is another example. Economic disruptions, especially in Egypt and Tunisia, caused asset value declines for funds during this period. Managers of hedge funds engaged in short-selling and used derivatives to protect themselves from volatility because they believed that market movements might be beneficial. However, the international involvement and diversified portfolios, mutual funds were unable to absorb the losses and lacked the resources to speculate. Many mutual funds eventually moved their investments from Egyptian markets to developed markets (Abumustafa, 2016).

1.4 How Will AI Affect Funds in Emerging Markets?

Technological developments, especially in artificial intelligence, have altered investment management. Fund managers can identify market trends and opportunities by using machine learning and natural language processing to analyze massive amounts of data quickly. According to Song (2020), fund managers gain valuable insights from recent articles and social media via natural language processing. Similarly, Strusani et al. (2024) highlight the use of predictive analytics to navigate emerging market volatility, improving decision-making and bridging data gaps in regions with insufficient reporting systems.

Artificial intelligence has arrived to assist in risk management. To explain further, machine learning can mitigate risks through the dynamic processing of real-time data. Additionally, the ability to leverage neural⁵ networks offers benefits in detecting correlations and

⁵ Models that are structured like a human's brain, where they recognise patterns to make predictions

early warning signs of systemic risks. Studies reveal that when it comes to adjusted returns, funds perform better than conventional models (Kosanović, 2023).

However, the characteristics of these markets hinder radical adoption. Lack of infrastructure, which includes a lack of technological resources and insufficient knowledge, is the biggest barrier to the scalability of artificial intelligence. Another problem that causes emerging economies to lag behind in technological advancements is regulations that do not meet the required standards. Consequently, companies are unable to fully integrate AI into their operations (Thanyawatpornkul, 2024). Lastly, artificial intelligence can also aid in sustainability and inclusive investment (Musleh Al-Sartawi, Hussainey, and Razzaque, 2022). That is, reports indicate that artificial intelligence is instrumental in incorporating environmental, social, and governance factors into fund managers' strategies⁶, for example, by analyzing social media posts on these topics. Artificial intelligence has also been a significant force behind robo-advisors, which have fostered greater financial inclusion. By delivering refined strategies for retail investors, AI has made investing more cost-effective and provided personalized financial advice (Schwinn and Teo, 2018). Nevertheless, becoming overly dependent on artificial intelligence is not ideal, as human oversight is essential to proactively address failures and systemic risks.

1.5 Decoding Hedge Fund Performance: From Metrics to Mastery

In the past, the first studies of hedge funds that came up were hindered due to the lack of reliable data, which ultimately made the findings weakly supported by the basic performance measurements and descriptive analysis (Fung and Hsieh, 1999).

Performance measurement models are essential to capture the differences in different strategies used by fund managers (Agarwal and Naik, 2004), given that hedge funds employ numerous management styles.

Nevertheless, linear models used to capture the performance of hedge funds did not entirely capture some strategies across different economic markets and asset classes (Capocci and Hübner, 2004). Therefore, if these models were solely employed for performance purposes without taking strategic considerations into account, the studies would ultimately have been rendered ineffective

⁶ Significant for emerging markets because their ESG reporting is unreliable

Over the years new data and information have become available, and researchers have taken the opportunity to integrate quantitative methods (e.g., multifactor performance models). Notably, Fung-Hsieh's seven and eight-factor models assess hedge fund performance with risk adjustment. During the credit crisis, a substantial difference in alphas was detected between the previous methods and alternative models. This indicates that the introduction of the eighth factor seems to capture some of the volatility in hedge fund returns during periods of crisis, which is particularly important for emerging markets (Fung and Hsieh, 2004).

However, recent studies are incorporating advanced models to examine funds' exposures. These studies have demonstrated that returns exhibit nonlinearity concerning market returns, indicating that nonlinear exposures fluctuate with financial conditions (Patton and Ramadorai, 2013; O'Doherty et al., 2015). Despite the varying visible exposures, factors such as volatility, equity market, and liquidity are common across strategies. It is crucial to remember that macroeconomic factors and systematic risk are key in explaining performance, especially when higher moment factors are taken into account.

1.6 Managing Mutual Fund Performance: The Important Metrics

"Focusing on markets, their results show that choosing performance measures is more relevant for emerging markets." – Santomil, 2022

The first model used to evaluate the performance of mutual funds was the Capital Asset Pricing Model, which was followed by risk-adjusted methods. Subsequently, the Treynor and Sharpe ratios made it easier to compare funds. In essence, the Treynor Ratio compares return to systematic risk, whereas the Sharpe Ratio evaluates returns in relation to overall risk. Even though there was an evolution to some extent, the problem was to choose the appropriate benchmark, since the market portfolio itself is not observable, leading to inconsistent results (Roll, 1977). Furthermore, the information ratio compares the active returns of a portfolio to a benchmark index, relative to the volatility of active returns. However, it does not indicate whether the performance is statistically significant. Lastly, Sortino introduced his ratio, which focuses on downside risk.

Addressing the regression-based models, which go from the first single-factor model (i.e., Jensen's alpha) to more advanced models (e.g., Fama-French and Carhart). These models aim to capture mainly risk factors such as macroeconomics, firm-specific characteristics, and financial markets, giving a better perspective of asset pricing. Nonetheless, the single-factor model was

severed criticized in several studies due to its simplicity and limited explanatory power, multifactor models are a better way to gauge the performance of funds. Furthermore, there were some irregularities in the conventional models, which prompted the addition of conditional measures that emphasized time-varying expectations and dynamic portfolio strategies. Conditional measures have been shown to improve the assessment of funds' performance in recent studies (Ferson and Schadt, 1996; Roy and Deb, 2003).

Market timing ability is crucial in evaluating mutual funds' performance as it distinguishes between selectivity and timing skills. The quadratic regression method, for instance, suggests that managers' market timing ability is evidenced by the significance of the quadratic term. Specifically, a significant and positive coefficient indicates favorable timing (Treynor and Mazuy, 1966). Alternatively, the dummy variable regression method uses market timing differently because it adjusts the portfolio's beta based on certain market conditions. With favorable timing, a significant and positive difference in beta will occur during fluctuations in the market (Henriksson and Merton, 1981). A model was then created expressly to quantify volatility timing, with the goal of lowering market risk exposure in return for higher volatility (Busse, 1999). Nevertheless, because of possible biases and misspecifications, previous models have come under fire. The Fama-French Three-Factor model, according to many detractors, offers a more accurate way to evaluate market timing skills.

Lastly, the semi-parametric model estimates mutual fund performance using data on stock holdings. Assigning non-negative weights to excess returns over different time periods is the aim here⁷. Initially, it was challenging due to the difficulty of determining the weights. Therefore, it was suggested portfolio composition weights instead, assuming that fund managers assign higher weights to higher-return stocks (Grinblatt and Titman, 1993). The model suffered later refinements as it lacked risk adjustment and a requirement for detailed mutual fund data. As a result, stocks began to be classified into benchmark portfolios by past returns, market capitalization, and book-to-market ratio (characteristics-based method). Positively, the model increased the statistical power and the explanation of returns (Daniel, 1997).

⁷ Positive period weighting

1.7 Strategic Insights: Exploring the Empirical Performance of Hedge Funds

The first empirical study conducted by Gonçalves (2013) analyzes various strategies employed by hedge funds and mutual funds. The main findings indicate that the "Commodity Trading Advisor" strategy was the most used among hedge funds, ranking first in almost all regions. In contrast, the strategy that proved to be most efficient in Asia was "Distressed Debt," with both strategies focusing on short selling. On the other hand, despite its high degree of diversification, the "Fund of Funds" strategy produced the worst outcomes. The author recommends more study on the makeup and efficacy of this post-crisis tactic.

Taking into account models that evaluate risk-adjusted performance, Benmahi and Avci's (2022) study examines the performance, risk, and diversification prospects of hedge funds' strategies. The study revealed that the inclusion of traditional and exotic risk models can significantly lead to an improvement in the evaluation of hedge funds' performance. After analyzing the Eurekahedge and Credit Suisse indices, it was observed that most strategies yielded positive and significant alphas, where "Emerging Markets" and "Distress Debt" led the performance. On the opposite way, "Market Neutral" and "Managed Futures" showed non-significant alphas, indicating poor performance when accounting for exotic risks. As for risk-adjusted performance, the author decided to measure it using the Sharpe Ratio. The strategies "Global Macro," "Multi-Markets," and "Distress Debt" were identified as top performers. However, despite having high returns, strategies such as "Emerging Markets" and "Managed Futures" had significant standard deviations, which reduced their risk-adjusted rankings.

A study by Sarvar and Wu (2010) analyzed the 2008 financial crisis to assess hedge fund strategies from 2004 to 2010. 2008 saw large losses for all strategies, but especially for "Equity Long/Short," "Merger Arbitrage," and "Convertible Arbitrage." 2009 saw robust recoveries with high annualized returns in "Strategical Arbitrage," "Merger Arbitrage," and "Multi-Strategy."

Regression analysis revealed that while strategies with negative beta values (Equity Short-Bias) produced higher positive alphas, those with higher beta values (Merger Arbitrage) produced negative alphas.

The Kruskal-Wallis H test confirmed substantial performance differences among strategies. Multiple regression analysis revealed that fund performance depends on strategy approaches, although the relationship is complex and not purely linear.

1.8 Mutual Fund Structures and Strategies: A Deep Dive into Investment Dynamics

Mutual funds have a different structure compared to hedge funds, they can be structured in three ways. Firstly, Open-end funds are the most flexible type, as investors can buy and redeem shares at any moment from the fund. Secondly, funds that issue just a given number of shares (through an Initial Public Offering) and afterward can trade those shares on the open market, such as the stock market, are called Closed-end funds. Ultimately, UITs are more complex because shares are issued in a fixed number of units once, with a specified end date, mainly when the trust is dissolved, and assets are fully distributed to investors.

Stock funds, which mainly invest in stocks, have a high short-term volatility but may yield larger long-term returns. Bond funds, on the other hand, focus more on debt instruments, which are susceptible to credit, interest rate, and prepayment risks. Balanced funds aim to reduce risk and increase diversification by combining stocks, bonds, and money market instruments. Money market funds seek to provide safety and liquidity while preserving a consistent net asset value (NAV) by investing in reliable, short-term securities. Specialized funds include alternative funds that employ unconventional tactics and smart-beta funds that seek to boost returns by concentrating on specific factors. Lastly, target-date funds gradually adjust their asset allocation, becoming more conservative as the target retirement date approaches (Investor.gov, 2017).

Fund types vary widely in their strategies. Index-based funds attract many investors due to their low fees, as they simply mimic a specific security index with minimal management. In contrast, actively managed funds frequently trade assets to closely match a targeted set of indicators. Some mutual funds have adopted inverse fixed multiples of short-term index returns to boost daily returns through compounding, though many argue these are unsuitable for long-term investors. Additionally, fund managers have started using hedge-fund-like strategies, enabling risk-seeking investors with less capital to pursue higher returns.

1.9 Hedge Funds vs. Mutual Funds: A Comparative Study of Risk and Performance

“In bad or neutral market environments, hedge funds outperform mutual funds while generating the same returns in good environments.” – Eling and Faust, 2010

Firstly, a study conducted by Ackermann and Liang (1999) analyzed the differences between hedge funds and mutual funds, as well as typical market benchmarks. They found that hedge funds consistently outperformed mutual funds, primarily due to their strategy flexibility, motivating incentives, and the strict legal regulations governing mutual funds. However, when comparing market benchmarks, hedge funds did not always show better performance, as benchmarks often performed better. Additionally, mutual funds and market benchmarks were shown to have the lowest volatility.

H_2 : Hedge funds outperform mutual funds in all regions due to their adaptive strategies.

Brown (1999) also examined the discrepancies in performance and persistence. He concluded that investment flexibility was the main reason for hedge funds' consistent performance, not luck or leverage (as some researchers argued).

Stulz (2007) consolidated studies that examine various aspects distinguishing hedge funds from mutual funds beyond comparative performance. This approach provides a deeper understanding of the environment faced by fund managers. In his empirical research, Stulz asserts that the superiority of hedge funds and their ability to offer strategies unavailable to mutual funds are linked to the remarkable growth of the hedge fund industry over the years.

Agarwal (2009) presented a noteworthy paper that explained why hedge funds achieve superior performance. The study involved a comparison of hedge funds, mutual funds, and most importantly, hedge mutual funds. It found that while hedge mutual funds fail to surpass hedge funds, they do manage to outperform traditional mutual funds. This can be attributed to the strategies used, which are similar to those of hedge funds but with lower leverage. Additionally, the author discusses that the level of managers' experience may be a contributing factor, as hedge mutual funds are often managed by the same managers responsible for mutual funds.

Lastly, Eling and Faust (2010) analyzed the performance of hedge funds in emerging markets, where strategies such as short selling and derivatives usage are very limited. They inferred that hedge funds' ability to actively alter asset distribution has contributed to their superior performance in unpredictable markets.

2. Methodology

2.1 Descriptive Statistics

Descriptive statistics are crucial for assessing the performance of funds because they provide an overview of the characteristics of returns and associated risks. Standard metrics such as the mean, median, volatility, skewness, kurtosis, and year-to-date returns are used to analyze the data.

2.2 Performance Ratios

The Adjusted Sharpe Ratio (Pezier and White, 2006) improves the traditional Sharpe Ratio as it includes skewness and kurtosis in the calculation. The Sharpe Ratio evaluates excess return per unit of risk, while the adjusted accounts for the impact of asymmetry and extreme returns; therefore, it assesses more accurately the performance of funds with non-normal return distributions:

$$\text{Sharpe Ratio} = \frac{r_i - r_f}{\sigma_i} \quad (1)$$

In this formula, r_i represents the average return of the fund, r_f is the risk-free rate, corresponding to each country's 10-year government bond yield to reflect country-specific opportunity costs, and σ_i denotes the standard deviation of the fund's returns, which measures total risk.

$$\text{Adjusted Sharpe Ratio} = SR \times \left[1 + \frac{\tilde{\mu}_3}{6} \times SR - \frac{K-3}{24} \times SR^2 \right] \quad (2)$$

Here, SR is the Sharpe Ratio as defined above, $\tilde{\mu}_3$ is the skewness of the returns, and K is the kurtosis of the returns.

Going deeper and as a continuation of the previous ratio, the Sortino Ratio is a variation that essentially focuses on downside risk, thus being a more appropriate ratio for measuring risk-adjusted returns. That is, the Sortino Ratio seeks to measure only the volatility that harms portfolio returns that are below a certain threshold (i.e., minimum acceptable return) and not the volatility that ensures gains. This ratio will be useful in our study as it is particularly suitable for measuring the performance of investments under adverse conditions, such as emerging markets:

$$\text{Sortino Ratio} = \frac{r_i - r_f}{\sqrt{E[\min(r_i - r_f, 0)^2]}} \quad (3)$$

In this case, the denominator represents the downside deviation. Specifically, $\min(r_i - r_f, 0)$ captures only the negative returns below the risk-free rate, and $E[\cdot]$ denotes the expected value. The denominator thus measures the volatility of harmful (i.e., negative) returns only.

Another variation of the Sharpe ratio that precisely measures the risk-adjusted return but focuses only on market risk (systematic) is the Treynor Ratio. This ratio evaluates how much excess return the fund generates through its beta, which represents sensitivity to market movements. This ratio is important for fund managers who seek to have their portfolios well diversified. In the study, it will be an added value to see the performance behavior of mutual funds accordingly:

$$\text{Treynor Ratio} = \frac{r_i - r_f}{\beta_i} \quad (4)$$

2.3 Model

By comparing the strategies of mutual funds and hedge funds, this methodology assesses their performance using annual returns. Morningstar and Yahoo Finance provided the mutual fund data, while the Hedge Fund Database provided the hedge fund data.

To ensure a diverse representation, only one fund per strategy was selected from each country, which implies that the results are purely exploratory and not statistically generalizable. In regions with limited fund availability, some selections were constrained. The dataset comprises annual samples spanning from 2015 to 2024. For this purpose, only a modern model will be included.

First, it is ideal to show Jensen's alpha, which will be used as the basis for our final model to measure the performance of the funds. It is based on the Capital Asset Pricing Model.

$$\alpha_i = R_{it} - R_{if} - \beta_i(R_m - R_{it}) - \varepsilon_{it} \quad (5)$$

Regarding the terms of the equation, α_i measures the performance of the portfolio considering annual returns that are superior compared to the market portfolio, all this after having adjusted for risk. On the other hand, β_i represents the sensitivity of the portfolio to market movements, while the error term, ε_{it} , is simply the idiosyncratic risk, the one that can't be explained by our model. Lastly, R_{it} is the return of the portfolio at time t, R_m is the market portfolio return (i.e., of the chosen benchmark), while R_{if} is the risk-free rate.

As a market proxy, the MSCI Emerging Markets Index will be used due to its broad inclusion of large and mid-cap equities across various emerging market regions, including those

under analysis. The data for this index was obtained from its official website on an annual basis. The primary objective of this study is to calculate the alpha to determine whether hedge funds indeed outperform mutual funds across the three selected regions—China, Indonesia, and Saudi Arabia—as a whole. To ensure a relevant risk-free rate, this study considers a 10-year analysis period (2015–2024). The chosen criteria include selecting government bonds. The emerging markets index is based on the average of China, Indonesia, and Saudi Arabia⁸ (CFETS, CEIC Data, Saudi Exchange, Macrotrends). Additionally, the United States will be included in the study using the S&P 500 as a market proxy. This serves as a complement to the analysis, allowing for a comparison with the funds of the largest and most stable economy, which possesses greater resources. This inclusion enables the gain of extra insights into the reality of emerging markets by contrasting them with a mature and developed market.

This study will present a tailored multifactor model to better analyze the specific variables:

$$R_{it} - R_{if} = \alpha_i + \beta_i(R_m - R_{it}) + \beta_{SMB}SMB + \beta_{HML}HML + \beta_{RMW}RMW + \beta_{CMA}CMA + \beta_{WML}WML + \varepsilon_{it} \quad (6)$$

Primarily, the "small minus big" factor is a concept that represents the size factor, added to capture the difference in returns between small-cap and large-cap stocks. Secondly, the "high minus low" factor represents the value factor, which considers differences in high and low book-to-market ratios (i.e., value vs. growth stocks). Thirdly, the "robust minus weak" factor is specially implemented to represent the profitability factor, considering high and low profitability firms. Moreover, the "conservative minus aggressive" factor captures whether firms either use conservative or aggressive investment strategies (relevant as hedge funds tend to have long positions in firms with high asset growth). Finally, the momentum factor is added to more efficiently measure the alphas of hedge fund returns, since fund managers often engage in rigorous active management, particularly by acquiring stocks that have been performing well and selling the losers. The data for these factors was acquired from the Kenneth R. French Data Library on an annual basis, following their respective indices. These indices will be substituted into the market

⁸ Saudi Arabia does not present 10-year government bonds, rather they issue Sukuks that range around 3-4%

return variable, ensuring an accurate representation of the factors. This approach enhances the robustness and reliability of the analysis.

Finally, to determine alpha using the model equation, the coefficients of the relevant factors must be acquired. Although a regression could be carried out, the small sample size—just 33 funds per fund type—means that the coefficients would probably be statistically insignificant.

Using a random effects model to perform a panel data regression is a more suitable method. Because it assumes random effects and takes into account unobserved heterogeneity among the funds, this method is especially well-suited for small samples. It also offers a more effective estimation and permits the addition of time-invariant variables. Because the p-value is less than 0.05, the alpha and the coefficients of the Fama-French model are therefore statistically significant.

The decision between using a fixed effects or random effects model was supported by the Hausman test. This test is crucial when dealing with panel data because it determines whether the explanatory variables and individual effects are correlated, which would render the random effects model inappropriate. By introducing the Hausman test, the aim is to ensure that the model selection is based on something statistical reasoning, rather than on assumptions alone.

The application of a random effects regression model is supported by the Hausman test results. The null hypothesis assumes no correlation and defends the use of random effects, whereas the alternative hypothesis suggests correlation and supports fixed effects. The results of the statistical test showed that there was no significant difference between the fixed and random effects estimates (chi-square = 0.00 with a p-value of 1.000). As a result, the null hypothesis is not rejected and the random effects model is judged appropriate for both datasets.

2.4 Score

In the next chapter, the best and worst strategies for each type of fund and region will be selected. The criteria used for the selection are based on a formula that provides score.

$$\text{Score} = \text{YTD Return} * 30\% + \text{Volatility} * -20\% + \text{Adjusted Sharpe Ratio} * 25\% + \text{Sortino Ratio} * 15\% + \text{Treynor Ratio} * 10\% \quad (7)$$

For this score, the highest percentage was assigned to the total return on investment, while the only negative percentage is volatility, which penalizes strategies with excessive risk. Put differently, volatility could be the decisive factor if two strategies yield comparable returns. Next,

the Sortino ratio only takes downside risk into account, whereas the adjusted Sharpe ratio measures the return adjusted for total risk, giving it greater weight than other performance ratios. Lastly, since the Treynor ratio only assesses return in relation to market risk, it represents the lowest percentage.

Both theoretical and practical factors are taken into account when choosing the weights for this composite score. Since the YTD Return directly reflects absolute performance, which is still a top concern for the majority of investors, it was assigned the highest weight (30%). To reflect a preference for stability and to deter excessive risk-taking, volatility was penalized (-20%). Among the risk-adjusted metrics, the Adjusted Sharpe Ratio (20%) was prioritized due to its consideration of both return and overall risk. The Sortino Ratio (15%) was given a moderate amount of weight because it can concentrate on downside risk, which is particularly crucial for risk-averse investors. Finally, because it only assesses performance in relation to systematic risk, which may not accurately reflect a strategy's risk exposure, the Treynor Ratio (15%) was assigned the least weight. The weight distribution follows Bacon's (2010) discussion, which highlights the importance of combining risk-adjusted and absolute measures to provide a thorough performance evaluation.

3. Empirical Findings

The next table compares the best and worst-performing hedge fund and mutual fund strategies in China, Indonesia, Saudi Arabia, and the U.S.

	Hedge Funds							
	Best				Worst			
	China	Indonesia	Saudi Arabia	United States	China	Indonesia	Saudi Arabia	United States
Strategy	Multi-Strategy	Market-Neutral	Long/Short Equity	Long/Short Equity	Fixed Income Arbitrage	Asset-Backed	Market-Neutral	Managed Futures
YTD twrr	1.982	1.638	2.901	2.292	0.133	-0.130	0.588	0.270
σ_d	0.011	0.086	0.016	0.019	0.036	0.126	0.062	0.041
β_{10y}	0.149	0.253	0.015	0.491	0.139	0.426	0.177	-0.104
Adjusted Sharpe Ratio	0.741	0.331	0.956	0.818	-0.498	-0.762	-0.092	-0.211
Sortino Ratio	8.057	0.457	6.432	5.409	-0.445	-0.633	0.137	-0.009
Treynor Ratio	0.795	0.420	6.881	0.213	0.095	-0.019	0.048	-0.250

	Mutual Funds							
	Best				Worst			
	China	Indonesia	Saudi Arabia	United States	China	Indonesia	Saudi Arabia	United States
Strategy	Multi-Alternative	Long-Short Equity	Corporate Bond	Other Allocation	Managed Futures	Market Neutral	Other Allocation	Market Neutral
YTD twrr	3.004	0.985	0.855	1.584	-0.176	0.152	0.248	0.154
σ_d	0.040	0.094	0.003	0.061	0.085	0.066	0.094	0.053
β_{10y}	0.635	0.399	0.035	0.898	0.157	0.060	0.527	0.129
Adjusted Sharpe Ratio	0.454	0.117	0.150	0.252	-0.814	-1.132	-0.359	-0.450
Sortino Ratio	3.326	0.066	7.240	1.539	-0.538	-0.858	-0.135	-0.185
Treynor Ratio	0.257	0.195	1.830	0.105	-0.104	0.248	-0.078	0.129

	Hedge Funds	Mutual Funds
ai	0.080	0.053

Table 1. Performance of Hedge Funds and Mutual Funds Across Regions and Strategies

The results obtained show the performance of the different strategies of hedge funds and mutual funds in four countries: China, Indonesia, Saudi Arabia, and the United States. Concerning hedge funds, the best strategies in each country were Multi-Strategy in China, Market-Neutral in Indonesia, Long/Short Equity in Saudi Arabia, and the United States. The total return weighted by time of these strategies varied between 1.638 in Indonesia and 2.901 in Saudi Arabia. The volatility remained low in the majority of the cases, with the lowest value recorded in China (0.011) and the highest in Indonesia (0.086). The beta, which measures the sensitivity of the market, varied between 0.015 in Saudi Arabia and 0.491 in the United States. The Adjusted Sharpe Ratio in the best strategies swung between 0.331 in Indonesia and 0.956 in Saudi Arabia, while the Sortino Ratio had the highest value in China (8.057) and the lowest in Indonesia (0.457). The Treynor Ratio varied between 0.213 in the United States and 6.881 in Saudi Arabia.

Among the worst strategies of hedge funds, stand out Fixed Income Arbitrage in China, Asset-Backed in Indonesia, Market-Neutral in Saudi Arabia, and Managed Futures in the United

States. The results of these strategies were extremely poor; Indonesia performed the worst (-0.130). The volatility of Managed Futures in the US was the lowest (0.041), while that of Asset-Backed in Indonesia was relatively high (0.126). The beta was -0.104 in the US and 0.426 in Saudi Arabia.

The values of the Adjusted Sharpe Ratio were negative in the majority of these strategies, with Saudi Arabia presenting the worst result (-0.762). The Sortino Ratio was negative for three out of the four strategies, and the Treynor Ratio varied from -0.250 in the United States to 0.095 in China.

The top mutual fund strategies were Corporate Bonds in Saudi Arabia, Long-Short Equity in Indonesia, Multi-alternative in China, and Other Allocations in the US. These strategies' overall returns ranged from 0.855 in Saudi Arabia to 3.004 in China.

The volatility remained low, with the lowest value registered in the United States (0.003) and the highest in Saudi Arabia (0.094). From 0.035 in Saudi Arabia to 0.898 in the US, the beta displayed significant fluctuation. All strategies had a positive Adjusted Sharpe Ratio, with Indonesia having the lowest value (0.117) and China having the highest (0.454). The Sortino Ratio varied greatly, ranging from 0.066 in Indonesia to 7.240 in Saudi Arabia. Indonesia had a lower Treynor Ratio (0.195) and the United States had a higher one (1.830).

The worst strategies for the mutual funds were Managed Futures in China, Market-Neutral in Indonesia, Other Allocation in Saudi Arabia, and Market-Neutral in the United States. The return of these strategies was significantly lower, with the lowest value registered in China (-0.176). The volatility varied between 0.053 in the United States and 0.094 in Saudi Arabia. The beta had its highest value in Saudi Arabia (0.527) and lowest in China (0.157). The Adjusted Sharpe Ratio was negative for all strategies, with the worst performance registered in Indonesia (-1.132). The Sortino Ratio was also negative for the majority of the cases, with values that vary from -0.858 in Saudi Arabia to -0.135 in the United States. The Treynor Ratio presented a similar behavior, with lower values in Saudi Arabia (-0.078) and the highest in the United States (0.129).

Finally, the value of the alpha, which represents the capacity of the funds to generate return above its expected accounting for the assumed risk, was 0.080 for the hedge funds and 0.053 for the mutual funds. This result indicates that, on average, the hedge funds were able to generate a risk-return slightly superior compared to mutual funds. The positive alpha for both categories represents that both funds were able to add value beyond the expected market return.

Based on Table 1, the effectiveness of investment strategies in improving fund performance differs significantly across regions, supporting *H1*. Having a look at hedge funds, the YTD was observed in Saudi Arabia's Long/Short Equity strategy (2.901) and China's Multi-Strategy (1.982), while Indonesia showed relatively modest performance even among its best strategy (1.638 in Market Neutral). Similarly, mutual funds had a strong regional variation, with China's Multi-alternative strategy achieving the highest return (3.004), whereas Saudi Arabia showed lower returns even in their best strategies (0.855 in Corporate Bond). The volatility and the other risk-adjusted measures exhibited inconsistent patterns, with certain regions performing well in some metrics but badly in others. This confirms that strategy performance is not uniform and is heavily influenced by local market conditions.

Hypothesis *H2* also supports the findings, as hedge funds consistently outperform mutual funds across most performance indicators. Hedge funds demonstrated superior risk-adjusted excess returns, as evidenced by their higher average alpha (0.080) when compared to mutual funds (0.053). Furthermore, when compared to their mutual fund counterparts, the top hedge fund strategies typically had better metrics and higher year-to-date returns. For example, the best mutual fund in the same region (Corporate Bond) had a Treynor Ratio of 0.105 and a Sharpe Ratio of 0.195, while Saudi Arabia's hedge fund strategy (Long/Short Equity) had an Adjusted Sharpe Ratio of 0.956 and a Treynor Ratio of 6.881. Even among the worst-performing strategies, hedge funds had more resilience with less extreme negative risk-adjusted values compared to mutual funds. Hence, they show greater adaptability and performance potential in emerging markets.

4. Discussion

The higher alpha observed in the hedge funds concerning the mutual funds in the countries of analysis can be better comprehended, including the nature of the markets (i.e., emergent vs. developed). The characteristics of the emerging markets provided a ground for hedge funds to manage the alpha through opportunistic strategies. For instance, they might have capitalized in moments of disruption or political changes – all of these events introduced periods of uncertainty and inefficiency that the managers could exploit.

Throughout the analysis, the markets were shaped by a series of global and regional events that may have contributed to the divergence in alpha performance. The COVID-19 pandemic and interest rate cycles – especially the aggressive hikes by the U.S. Federal Reserve from 2021 onwards – represent macroeconomic conditions in which hedge funds gain an advantage due to their greater flexibility. For example, during the pandemic, hedge funds with global macro and long/short equity strategies could quickly reposition portfolios or hedge downside risks, while mutual funds were more constrained by their mandates and liquidity requirements.

Moreover, the greater financial liberalization and market development in China and Saudi Arabia, e.g., the inclusion of Chinese A-shares (company stocks traded on local exchanges, primarily available to domestic investors in that country) in global indices or the opening of Saudi markets to foreign investors created transitional phases with asymmetric information and price discovery lags which gave the possibility to hedge funds to exploit these opportunities in the less mature (less transparency) segments of the market.

In contrast, the United States has a more efficient market, where most information is rapidly reflected in the prices; consequently, getting a higher alpha is inherently more difficult, which leads to a less pronounced difference in the performance between the funds. Still, the consistent advantage of hedge funds in this market underlines the superiority in terms of adaptability and risk management techniques.

Lastly, it is plausible that the types of managers (their behavior) are also different. The period between 2015 and 2021 verified low interest rates, pushing investors towards hedge funds that offered alternative strategies, which in turn allowed these funds to leverage even more. While

mutual funds had to compete with lower-cost passive options, this limited their ability to invest in higher-cost strategies. Therefore, the higher alpha of hedge funds is not only a function of strategy and structure but is also related to macroeconomic conditions that could distinguish them from mutual funds.

The strategy Long/Short Equity shows a good performance in the emerging markets for both types of funds. It is designed to exploit inefficiencies and volatility that are more prevalent in these regions. These strategies consist of taking long positions in securities expected to appreciate and short positions in those expected to decline. By having two options, managers seek alpha on both sides of the trade but are also able to hedge against market risk. Long/Short strategies capitalize on these divergent paths, giving an advantage over long-only approaches that are more exposed to systemic risk. Because of their adaptability, they can also modify their net exposure in response to specific market circumstances. In other words, managers may limit market exposure to limit the downside during times of macroeconomic volatility or political unpredictability while still capturing alpha through relative value trades. Additionally, the possibility of shortly overvalued stocks (common in emerging markets) acts as an edge against bubble periods (for example, post-rally corrections).

On the other hand, Market-Neutral strategies, despite their theoretical appeal of “removing risk”, have consistently underperformed across both hedge funds and mutual funds in emerging markets. Market-neutral strategies rely on the assumption that relative mispricing between securities will converge over time and that long and short positions can offset systemic market movements. But in practice, as seen before, in less efficient markets, these assumptions break down. Firstly, in emerging markets, the common shifts cause correlations between securities to become unstable, going against the models (one example, statistical arbitrage) that Market-Neutral strategies depend on. Secondly, implementing short positions is more difficult and expensive in these types of markets, where lending markets are less developed and borrowing costs are higher. Thirdly, short squeezes are common, and the lack of liquidity makes it harder to exit positions efficiently. In addition, they are low-beta strategies that aim to generate returns through small pricing inefficiencies, needing higher precision in stock selection and execution (more complex and less freedom compared to Long/Short Equity). So, this strategy works better in developed markets as they provide diversification and stability due to their dependence on predictability, liquidity, and reliability in pricing valuations.

These results are generally in line with the literature review that was previously discussed, especially the idea that hedge funds typically perform better than mutual funds because of their strategic adaptability and capacity to change with the market. For example, Eling and Faust (2010) pointed out that hedge funds typically perform better in unfavorable market conditions; this trend surfaced during the COVID-19 era and other macroeconomic upheavals discussed in this study. Additionally, the strong alpha generated by opportunistic strategies like Long/Short Equity in emerging markets is consistent with Benmahi and Avci's (2022) findings of positive and significant alphas for similar strategies, especially in volatile markets. However, the data's poor performance of Market-Neutral strategies confirms the literature review's concerns about their limitations in less successful environments, where assumptions such as stable correlations and the ease of short-selling often fall short. Additionally, the findings support the assertions made by Ackermann and Liang (1999) and Agarwal (2009) that hedge funds, with their enhanced risk management capabilities and less restrictive structural limitations, can exploit market conditions in ways that traditional mutual funds cannot. All things considered, the empirical results show how important market context and strategy selection are in affecting fund performance, in addition to supporting previous academic findings.

Conclusion

The comparative analysis of hedge funds and mutual fund strategies across China, Indonesia, Saudi Arabia, and the United States demonstrates that regional characteristics and strategic flexibility are important in determining fund performance. Due to their flexibility and opportunistic management, hedge funds were better able to generate higher returns, particularly in emerging markets. Both the strategy and the way it was executed in unpredictable and ineffective market conditions contributed to their outstanding alpha performance. Their exceptional alpha performance is linked to both the strategy and how well it was implemented in erratic and ineffective market conditions. Their superior alpha performance is associated not only with the strategy but also with its execution under volatile and less efficient market conditions. In contrast, mutual funds were more constrained due to their regulatory requirements and structural rigidity, obstructing their responsiveness to rapid market shifts. Once again, Long/Short Equity strategies consistently outperformed in regions where inefficiencies and volatility are more prevalent, while Market-Neutral approaches underperform due to structural limitations in emerging markets.

Due to data availability constraints, this study uses a small, illustrative sample of one fund per strategy per country. These results should be regarded as explanatory rather than conclusive. Future research should use a larger, more representative sample.

Future research might also examine the impact of technological innovation and data analytics on fund performance. It would be crucial to evaluate whether algorithmic trading, machine learning models, and alternative data sources offer a quantifiable edge over conventional strategies, especially for emerging markets, given the increasing adoption of these tools by hedge funds. The idea would be to do comparative studies between “tech” funds and conventional funds across different regions could potentially reveal how this transformation is changing the investment industry. Additionally, understand more about the integration of ESG factors across hedge and mutual fund strategies and risk exposure, especially as investors’ preferences have been shifting towards responsible assets. Lastly, research could be conducted on how the “lifecycle” of funds – age, size, and historical performance affects their ability to generate alpha over time.

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Appendixes

returns	Coefficient	Std. err.	z	P> z
[95% con				
f. interval]				
mktrf	.014132	.0045991	3.07	0.002
.0051179				
	.023146			
smb	.0058496	.0016719	3.50	0.000
.0025727				
	.0091265			
hml	-.0246264	.0106988	-2.30	0.021
-.0455956				
	-.0036572			
rmw	.0166986	.0071531	2.33	0.020
.0026788				
	.0307184			
cma	.046055	.020903	2.20	0.028
.005086				
	.0870241			
rf	.0422815	.0166999	2.53	0.011
.0095504				
	.0750126			
wml	-.0093349	.0036935	-2.53	0.011
-.0165741				
	-.0020958			
_cons	.0795794	.0202646	3.93	0.000
.0398615				
	.1192972			
sigma_u	.00860981			
sigma_e	.12238858			

Table 2. Hedge Funds Random-effects GLS regression

returns	Coefficient	Std. err.	z	P> z
[95% con				
f. interval]				
mktrf	.0011617	.0044361	0.26	0.793
-.0075329				
	.0098563			
smb	.0034985	.0016127	2.17	0.030
.0003377				
	.0066593			
hml	.0085511	.0103197	0.83	0.407
-.0116751				
	.0287773			
rmw	-.0022769	.0068996	-0.33	0.741
-.0157999				
	.0112462			
cma	-.0195182	.0201623	-0.97	0.333
-.0590356				
	.0199991			
rf	-.0152554	.0161081	-0.95	0.344
-.0468268				
	.0163159			
wml	.0003304	.0035626	0.09	0.926
-.0066522				
	.007313			
_cons	.0528262	.019493	2.71	0.007
.0146206				
	.0910318			
sigma_u	0			
sigma_e	.11946824			

Table 3. Mutual Funds Random-effects GLS regression

48 . hausman fixed random

```

>               Coefficients
>               (b)      (B)      (b-B)
>      sqrt(diag(V_b-V_B))
>               fixed      random      Differen
> ce
>               Std. err.
> -----
>      mktrf |      .0011617      .0011617      -1.01e-
> 14
>               .0006892
>      smb |      .0034985      .0034985      -1.73e-
> 15
>               .0002506
>      hml |      .0085511      .0085511      2.36e-
> 14
>               .0016033
>      rmw |      -.0022769      -.0022769      -1.52e-
> 14
>               .001072
>      cma |      -.0195182      -.0195182      -4.63e-
> 14
>               .0031325
>      rf |      -.0152554      -.0152554      -3.52e-
> 14
>               .0025027
>      wml |      .0003304      .0003304      7.69e-
> 15
>               .0005535
> -----
>               b = Consistent under H0 and
> Ha; obtained from xtreg.
>               B = Inconsistent under Ha, efficient under
> H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

      chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
              = 0.00
Prob > chi2 = 1.0000

```

Table 4. Hausman test for hedge funds and mutual funds