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# A Study on the Performance of Japanese ETFs

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## ABSTRACT

The current study examines the performance of 76 Japanese equity Exchange Traded Funds (ETFs) over the period 1/1/2018-12/31/2022. Performance is estimated in several ways, that is, raw returns, alphas from single- and multi-factor regression models, and risk-adjusted returns. The market timing skills of ETF managers are examined too. The results reveal that, on average, the examined ETFs do not produce any material alpha. The results also indicate that the risk factors suggested by Fama and French (1993 & 2015) are more or less capable of explaining the performance of the Japanese ETFs. Finally, the findings show that 21% of ETF managers possess some sort of market timing skills. However, the managers fail to time the volatility of the stock market.

## KEYWORDS

ETFs; Performance; Japanese Stock Markets; Market Timing

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## 1. Introduction

This study focuses on the Japanese market of Exchange Traded Funds (ETFs). Investing in Japanese financial assets is of particular interest because Japan is the third biggest economy in the world with a Gross Domestic Product of US$4,231 billion as of October 16, 2023.[1] Japan is distinguished by its progressive technology, manufacturing prowess and mighty service industry. Prominent sectors include automotive, electronic, machinery and financial domains. Moreover, Japan is notorious for its work ethic, innovation, and high-quality exports. In addition, Japan is considered to be one of the safest and most politically stable countries in the world. Furthermore, the Japan Exchange Group is among the world's five largest stock exchanges by market capitalization. Finally, according to Morgan Stanley, Japanese equities in particular can function as "good hedges for a peaking U.S. dollar".[2]

The powerful economic and stable politic environment of Japan entails that quite promising investment choices can be detected in the capital market of the country, which can be exploited by domestic or international investors who wish to take place in Japan. An efficient tool available to those wishing to invest in the Japanese market is ETFs.

Similar to other ETF products worldwide, the Japanese ETF market provides investors with a wide range of investment choices including stocks, bonds, commodities, leveraged products and other financial instruments. The access to these choices is attained by simply purchasing ETF shares without needing to buy the underlying assets themselves. Contrary to investing in ordinary stocks, where tens of millions of yen are frequently required, initial investment in Japanese ETFs is possible with just thousands or tens of thousands of yen.

ETFs in Japan are an attractive option for investors who are looking for long-term investments which combine high diversification and liquidity with low fees. Risk is diversified via investing in multiple issues and liquidity is facilitated by the actions of designated participants who place bids and offers based on the net assets of ETFs.[3] On the other hand, the management fees of the Japanese ETFs are quite low and range from 0.06% to 0.95%. These rates can be quite comparable to the management fees charged by ETFs in other international ETF markets.[4]

Along with the similarities of the Japanese ETF market to other international ETF markets, there are some differences too. The main difference is that, generally speaking, Japan's market is more limited than other markets, especially the ETF market in the U.S., both in terms of size and variety. This difference is probably due to the fee structure of the Japanese ETF market (and other Asian markets too). Whereas the trend in the U.S. market has been toward a fee-only fiduciary model, in Japan, many ETFs continue to be sold by agents on commission.[5]

Another difference detected when comparing the Japanese ETFs to their U.S. peers concerns the discount or premium between their trading prices and net asset values. In particular, ETFs in Japan have a significantly negative premium (i.e., discount), which could be attributed to the Bank of Japan's participation in subsidizing the ETF market. On the other hand, the U.S. ETFs have a positive premium, which implies that the market views these funds as holding a bit more risk. Differences in tracking errors can be detected too.[6]

Based on the generally accepted beneficial features of ETFs, the usage of such products by retail investors in Japan has been growing continuously over the last years reaching 1.3 trillion yens in 2022 (about 2.2% of ETFs' total assets under management for the year).[7] This continued increase in ETF holdings by individual investors is

[1] Source: https://www.forbesindia.com/article/explainers/top-10-largest-economies-in-the-world/86159/1.
[2] Source: https://www.etftrends.com/model-portfolio-channel/pros-cons-investing-japan-etfs-2023.
[3] With respect to risk, investors should keep in mind that ETFs traded in Japan are all JPY-denominated. However, when such products invest in foreign currency-denominated assets, the risk relating to currency fluctuations of the relevant currencies and JPY might be high.
[4] For instance, according to data from Morningstar, the average expense ratio for U.S.-listed ETFs in 2022 amounted to 0.17%. Source:https://www.pionline.com/exchange-traded-funds/us-etfs-average-expense-ratio-declines-2022-morningstar.
[5] Refer to https://www.investopedia.com/terms/j/japan_etf.asp.
[6] Refer to https://rpubs.com/oobang/1034813 for a detailed comparison between Japanese and U.S. ETFs.
[7] Total assets under management by the Japanese ETFs at the end of 2022 amounted to 59.2 trillion Japanese yens, whereas 1.3

expected to become even greater in the years to come. The number of retail ETF holders in 2022 exceeded 1.17 million and keeps increasing.

Retail investors are attracted by the ability of ETFs to function as an international diversification investment tool. The ETF types of choice for the Japanese retail investors mainly include inverse leveraged products and Japanese and foreign equity holdings, with particularly strong interest in foreign equity ETFs.

The Japanese market is one of the most significant regional ETF markets worldwide. By the end of December 2022, US$454 billion were invested in ETFs in Japan.[8] At the same date, total ETF assets under management reached US$6.7 trillion globally.[9] These numbers indicate that the Japanese ETF market captures about 7% of the global ETF market.

In addition, as of December 2, 2023, 256 ETF products were listed in the Japan Exchange Group. 100 of them track various broad market, sector and other equity indexes, 66 ETFs follow international equity indexes, 33 are bond ETFs (invested mostly in foreign issues), and 22 ETFs products invest in commodities or commodity indexes. The rest ETFs focus mainly on real estate. In addition, 18 management companies are involved in the Japanese ETF market.

This study examines the performance of 76 Japanese equity ETFs over the period 1/1/2018-12/31/2022. Several methods are used to compute performance, namely, raw returns and alphas deriving from the single-factor model, as well as the Fama and French (2015) six-factor regression model. Furthermore, the risk-adjusted returns of ETFs is calculated using the Sharpe, Treynor and Modigliani-Modigliani (M&M) ratios. In the last step, the market timing skills of ETF managers in Japan are assessed.

The empirical findings show that the examined ETFs cannot beat the benchmark that has been created by Fama and French for the Japanese stock market. Moreover, the empirical findings reveal that the market factors that have been suggested by Fama and French (2015) have some explanatory value for the performance of ETFs, which, however, is not always monotonic. Finally, as far as market timing skills are concerned, the results show that 21% of ETF managers possess some sort of such skills.

This paper has been motivated by the lack of extended literature on the performance of Japanese ETFs. To the best of our knowledge, the literature on Japanese ETFs so far has mainly focused on the effects caused on the constitutes (stocks) of ETFs by the purchases of ETF shares on behalf of the Bank of Japan. Other studies examine the performance of leveraged ETFs, while other older studies focus on the microstructure and efficiency of the Japanese ETF market. Thus, the lack of recent research on the performance of "traditional" equity ETFs, combined with the increasing interest in the Japanese ETF market expressed by the continues growth in assets under management, renders our study as a significant contribution to the international literature on ETFs. Moreover, our study might help investors (and not just the Japanese ones) to make more informed decisions when investing in the Japanese ETF market.

The remainder of this paper is structured as follows: Section 2 provides the review of major studies concerning the Japanese ETF market. Section 3 develops the research methodology applied in our study and describes the sample used. Empirical findings are discussed in Section 4 and conclusions are offered in Section 5.

trillion yens (2.2%) are held by retail investors. Sources: i) https://www.statista.com/statistics/1219541/japan-net-assets-of-etfs/, and ii) Tokyo Stock Exchange, Inc., February 2023, "ETF Usage by Individual Investors - ETF Survey Results", https://www.jpx.co.jp/english/corporate/news/news-releases/0060/dreu25000000112k-att/press2_20230216-01e.pdf.

[8] Source: https://etfgi.com/news/stories/2023/03/etfgi-reports-assets-us457-billion-invested-etfs-industry-japan-end-february.

[9] Source: https://www.oliverwyman.com/media-center/2023/apr/etfs-to-account-for-24-percent-of-total-fund-assets-by-2027-reveals-new-study.html).

## 2. Literature Review

As already noticed, the literature on the performance of the Japanese ETFs is rather poor. A main part of the literature concerning ETFs traded on the Japanese capital market examines the impact on the stock market in Japan by the Bank of Japan's (BOJ) trading activity in the local ETF market. In this respect, Hanaeda and Serita (2017) examine the differences in volatility between ETFs and the underlying stocks using Nikkei 225 ETFs. The results show that the differences in volatility are small, but they can get big temporally, especially when the BOJ participates in the ETF market. By using Nikkei 225 and non-Nikkei 225 ETFs, Harada and Okimoto (2021) find that the afternoon returns of the underlying stocks are significantly higher than those of non-Nikkei 225 stocks when the BOJ buys ETF shares.

In the same context, Barbon and Gianinazzi (2019) accentuate a positive and persistent impact on stock prices by the trading activity of BOJ in the ETF market. Charoenwong et al. (2021) report that from January 2011 through March 2018, the BOJ purchased equity ETFs amounting to about 3.5% of the country's GDP. This activity resulted in increased stock valuations, more share issuances and increased total assets under management.

Koyama (2020) also examines the effects of the BOJ's ETF purchases on stock prices trying to answer whether i) these effects are predictable, ii) the effects of expected versus unexpected purchases differ to each other, and iii) price effects are long lasting. The results show that the trading activity of the BOJ in the ETF market becomes less predictable. Moreover, the expected purchases do not affect stock prices, while the unexpected purchases have a significantly positive but temporary impact on the prices of underlying stocks.

In a slightly different context, Gunji et al. (2021) examined how the purchase of ETFs by the BOJ affects the underlying companies' profit, innovation investment and corporate governance. The results show that the ETF purchase policy of the central bank lowered the return on assets of TOPIX and Nikkei 225 firms by 0.5%-2.0% and 1.0%-3.4%, respectively. Katagiri et al. (2022) report that the trading activity of the BOJ in the ETF market has resulted in lower risk premia for the ETFs' underlying companies. Similar results are provided by Adachi *et al*. (2021). According to Hattori and Yoshida (2023), the decline in equity risk premia relating to the BOJ's activity in the ETF market becomes more significant during an economic downturn.

In another study, not relating to the BOJ's purchases of ETFs, Miu *et al*. (2021) investigate the tracking performance and pricing efficiency of Japanese equity leveraged ETFs, which employ only futures contracts to attain the desired exposure to the underlying benchmark index. The findings indicate that funds with positive (negative) leverage ratios tend to outperform (underperform) their benchmarks. Outperformance or underperformance concentrates on the popular ex-dividend dates of the underlying index's constituent stocks.

Going further, Iwai (2009) focuses on the microstructure of the Japanese ETF market highlighting the lack of indicative NAVs, market makers and ETF derivatives compared to other developed markets in Europe and the U.S. As a result, the liquidity of many Japanese ETFs is low resulting in large intraday deviations between trade prices and net asset values. This finding indicates that efficient arbitrage mechanisms through in-kind transactions are not in place. The analysis also shows that the small trade orders are less sensitive to deviations that can reflect arbitrage opportunities compared to the large orders. This finding suggests that there is information asymmetry between large and small investors.

Kono et al. (2011) assesses the market efficiency of the Japanese equity market by comparing the performance of a portfolio consisting of ETFs to the market portfolio represented by the TOPIX Index during the period June 2008 to June 2009. The main conclusion of the study is that an optimal ETF portfolio can outperform the market index, when performance is measured as the Sharpe ratio, suggesting that the market is not efficient. Similar inefficiencies are reported by Iway (2010).

Finally, Iway (2011) examines the validity of the Law of One Price with data of 53 ETFs from the Japanese market over the period August 2008 to August to 2010. The findings indicate that this Law fails in the Japanese ETF

market for at least two reasons. The first reason concerns the differences in the speed of price discovery between the primary and secondary markets. These differences result in mispricing. The second reason relates to the idiosyncratic noise trader risk which seems to prevent arbitrageurs from engaging in long-short arbitrage trading. On the other hand, systematic investor sentiment does not seem to be a major obstruction in Japanese ETF markets.

The analysis of the literature records on the Japanese ETFs that are available so far verifies our claim about the lack of a recent comprehensive study on the performance of this investment tool, which is, however, of particular interest to investors given the hundreds of billions invested in them. Our study seeks to fulfil this gap in the literature and provide reliable empirical evidence on the performance of Japanese ETFs and the ability of their managers to produce significant positive alphas and time the market.

## 3. Methodology

### *3.1. Single-factor Performance Analysis*

The first model used to examine the performance of ETFs is the following:

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + \varepsilon_i \quad (1)$$

where, $R_i$ denotes the daily return of ETFs, which has been calculated with Net Asset Values (NAVs) that have been found on the websites of ETFs' managing companies. $R_m$ represents the return of the market index and $R_f$ is the risk-free rate. The historical daily data of the market index and the risk free rate in Japan have been found on the website of Kenneth French. The alpha coefficient of the model represents the above-market return that can be achieved by an ETF. Beta measures the part of risk that cannot be mitigated by diversification techniques and indicates the systematic risk of ETFs.

The model is applied for each single ETF with the Ordinary Least Squares (OLS) method and, when necessary, adjustments are made to deal with autocorrelation and heteroskedasticity issues.

### *3.2. Six-Factor Performance Analysis*

We evaluate the exposure of ETFs to certain market factors with the Fama and French (2015) five-factor model, to which we add the momentum factor of Carhart (1997). The model is shown in equation (2):

$$R_i - R_f = \alpha_i + \beta_{1,i}(R_m - R_f) + \beta_{2,i}SMB + \beta_{3,i}HML + \beta_{4,i}RMW + \beta_{5,i}CMA + \beta_{6,i}MOM + \varepsilon_i \quad (2)$$

where $R_i$, $R_m$ and $R_f$, are defined as above. *SMB* (Small Minus Big) is the average return on nine small-cap portfolios minus the average return on nine large-cap portfolios. *HML* (High Minus Low) is the average return on two value portfolios (in book-to-market equity terms) minus the average return on two growth portfolios. The *RMW* (Robust Minus Weak) and the *CMA* (Conservative Minus Aggressive) factors correspond to the Fama and French (2015) operating profitability and investment factors. *MOM* is the momentum factor.[10]

The model is applied for each single ETF in the sample with the OLS method and, when necessary, adjustments are made to deal with autocorrelation and heteroskedasticity issues.

In the Fama and French model, the size effect implies that small cap companies outperform the large ones. The book-to-market equity ratio effect captured by the *HML* factor implies that the average returns on stocks with a high book-value to market-value equity ratio must be greater than the returns on stocks with a low book-value to

[10] The historical daily data of the Fama and French three "traditional" factors, the robust minus weak factor, the conservative minus aggressive factor, and the momentum factor for the Japanese stock market, are available on http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

market-value equity ratio. Moreover, according to Fama and French (2015), a negative loading is expected for the *RMW* factor, that is, the excess return of ETFs must be affected by the profitability factor in a negative fashion. Furthermore, past investment is viewed as a proxy for the expected future investment. Fama and French (2015) suggest that *CMA* implies a negative relationship between the expected investment and the expected internal rate of return. Finally, the existence of a momentum in asset prices is considered to be an anomaly which is difficult to explain, because the efficient capital markets theory suggests that an increase in the price of an asset cannot indicate a further increase in future prices. An explanation to this anomaly offered by behavioralists is that investors are not rational and that they underreact to the release of new information. In doing so, investors fail to reflect new information into stock prices.

### *3.3. Risk-Adjusted Returns*

We employ standard risk-adjusted return measures to rate the performance of ETFs in Japan. The first evaluation method used is the Sharpe ratio shown in formula (3):

$$S_{p,i} = \frac{\overline{R}_{p,i} - \overline{R}_f}{\sigma_{p,i}} \tag{3}$$

where, $\overline{R}_{p,i}$ denotes the average daily return for the *ith* ETF, $\overline{R}_f$ is the average daily risk-free rate and $\sigma_{p,i}$ is the standard deviation of ETF excess returns.

The Sharpe ratio is estimated by the division of excess return by risk and is used to determine how well an ETF compensates its investors for the per unit risk they take. The higher the Sharpe ratio, the better the performance of the ETF.

The second risk-adjusted return measure used is the Treynor ratio, which is shown in formula (4):

$$T_{p,i} = \frac{\overline{R}_{p,i} - \overline{R}_f}{\beta_{p,i}} \tag{4}$$

where $\overline{R}_{p,i}$ and $\overline{R}_f$ are defined as above and $\beta_{p,i}$ is the systematic risk of ETF *i*. We run two versions of the Treynor ratio; one with betas from the single-factor regression model (1) and one with betas from the multi-factor regression model (2).

The Treynor ratio, also known as the reward-to-volatility ratio, is a performance metric for determining how much excess return has been generated for each unit of risk taken on by a portfolio. Similar to the Sharpe ratio, the higher the Treynor ratio, the better the performance of an ETF.

The third metric of risk-adjusted return is the Modigliani-Modigliani (M&M) ratio. This ratio is an extended version of the Sharpe ratio which gives the risk-adjusted return of an ETF portfolio by multiplying the Sharpe ratio with the standard deviation of the benchmark index and adding the risk-free return thereafter to it. The M&M ratio is shown in the following formula (5):

$$MM_i = S_i * \sigma_m + R_f \tag{5}$$

where $S_i$ is the Sharpe ratio of the $i_{th}$ ETF and $\sigma_m$ is the standard deviation (risk) in market returns. $R_f$ is defined as above. The higher the M&M ratio, the better the performance of an ETF.

### *3.4. Market Timing Analysis*

The ability of ETF managers in Japan to time the market is evaluated in this section. We use two alternative models to assess the market timing skills of ETF managers. The first method is the Treynor and Mazuy (1966) model shown in equation (6):

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + \gamma_i(R_m - R_f)^2 + \varepsilon_i \quad (6)$$

where, $R_i$, $R_m$, $R_f$, $\alpha_i$ and $\beta_i$ are defined as above. $\gamma_i$ measures the market timing skills. A positive and significant gamma estimate indicates the existence of market timing skills. The model is applied with the OLS method and, when necessary, adjustments are made, to deal with autocorrelation and heteroskedasticity issues.

The second model used is that of Jagannathan and Korajczyk (1986). This model is based on Treynor and Mazuy (1966) model and further includes a cubic term of market excess performance. According to Holmes and Faff (2004), the cubic term is used to evaluate the ability of managers to time the volatility of the market. The model is shown in equation (7):

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + \gamma_i(R_m - R_f)^2 + \delta_i(R_m - R_f)^3 + \varepsilon_i \quad (7)$$

where $R_i$, $R_m$, $R_f$, $\alpha_i$, $\beta_i$ and $\gamma_i$ are defined as above and $\delta_i$ measures the response of each ETF to market volatility. The model is applied with OLS and, when necessary, adjustments are made to deal with autocorrelation and heteroskedasticity issues.

Following Rompotis (2013), we note that we apply models (6) and (7) to passively managed ETFs without expecting the managers of passive ETF managers to present any meaningful timing skills as they are not supposed to. However, they need to follow the tracking index and adjust their portfolios whenever the synthesis of the benchmark changes without delays. Therefore, our testing examines the ability of managers to timely respond to changes in the synthesis of the underlying indexes.

### *3.5. The Sample*

As mentioned in a previous section, at the time this study is being conducted, 256 ETFs are trading on the Japanese stock market, of which 166 are equity funds. In our analysis, we focus on the equity niche of the Japanese ETF market and cover the five-year period 1/1/2018-12/31/2022 to have sufficient data for our tests. From the 166 equity ETFs, 64 were launched in 2019 or later. Therefore, these newly launched ETFs have been excluded from our sample. From the rest 102 equity ETFs, only 76 provide free NAV data. Therefore, our sample includes these 76 equity ETFs, which represent 46% of the total equity ETFs that trade on the Japanese stock market.

Table 1 presents the profiles of ETFs, which include their age (as of 12/31/2022), fees and assets. The presentation is made on a firm-by-firm basis for the five managing companies considered in our analysis.[11] These companies are BlackRock Japan, which manages 11 ETFs of our sample, Nikko Asset Management, with 16 ETFs in the sample, Mitsubishi UFJ Kokusai Asset Management, which manages 9 ETFs, Nomura Asset Management, which is the biggest company in our sample in terms of total managed ETFs (38) and total assets under management (US$ 190 billion), and Norinchukin Zenkyoren Asset Management with only 2 ETFs in our sample.

The average age of the examined ETFs approximates 12 years. The most aged fund in the sample is about 28 years-old. On the other hand, the newest fund in the sample is 5 years-old. These numbers imply that the Japanese ETF market is rather a mature stock market.

[11] The data presented in Table 1 have been found on the websites of ETFs' managing companies.

On the costs charged by the managing companies, Table 1 reports an average trust fee of 27 basis points (bps). The minimum fee in the sample is just 5 bps, while the maximum fee is 95 bps. These numbers indicate that the Japan ETFs are a rational investment choice from a cost perspective, as it is usually the case with passively managed ETFs in other developed ETF markets.

This Table presents the profiles of the sample's ETFs as of 12/31/2022. The presentation is made per the managing company of the ETFs examined and for the entire sample. Profiles include the age of ETFs, their trust fee, average assets over the study period (1/1/2018 – 12/31/2022), and their assets as at 12/31/2022.

**Table 1.** Profiles of ETFs

| BlackRock Japan - 11 ETFs | Age | Trust Fee | Av. Assets ($) | Total. Assets ($) |
|---|---|---|---|---|
| Mean | 7.80 | 0.14 | 1,683,336,622 | 18,516,702,843 |
| Min | 5.26 | 0.05 | 48,841,211 | |
| Max | 21.33 | 0.23 | 6,799,920,429 | |
| Nikko Asset Management - 16 ETFs | | | | |
| Mean | 12.07 | 0.25 | 5,401,453,080 | 86,423,249,276 |
| Min | 5.81 | 0.09 | 6,445,405 | |
| Max | 21.48 | 0.50 | 55,984,462,582 | |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | |
| Mean | 8.88 | 0.21 | 2,836,723,188 | 25,530,508,694 |
| Min | 5.05 | 0.08 | 25,526,236 | |
| Max | 13.85 | 0.50 | 18,191,625,991 | |
| Nomura Asset Management - 38 ETFs | | | | |
| Mean | 13.90 | 0.33 | 5,008,595,354 | 190,326,623,452 |
| Min | 5.06 | 0.06 | 102,418 | |
| Max | 27.61 | 0.95 | 120,940,256,361 | |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | |
| Mean | 8.82 | 0.18 | 779,055,107 | 1,558,110,214 |
| Min | 8.82 | 0.11 | 101,512,766 | |
| Max | 8.82 | 0.25 | 1,456,597,448 | |
| Sample -76 ETFs | | | | |
| Mean | 11.91 | 0.27 | 4,241,515,717 | 322,355,194,479 |
| Min | 5.05 | 0.05 | 102,418 | |
| Max | 27.61 | 0.95 | 120,940,256,361 | |

When it comes to assets, the relevant average term over the study period amount to US$ 4 billion. In addition, there is a wide gap between the extreme scores of assets in the sample, that is, US$ 102 thousand and 121 billion at a minimum and a maximum, respectively. Moreover, total assets held by the examined managing companies at the end of 2022 amounted to US$ 322 billion. The figures about assets verify the significance of the Japanese ETF market in the global ETF landscape.

Table 2 presents the descriptive statistics of returns for the sample's ETFs over the period 1/1/2018-12/31/2022. Descriptive statistics include average returns, total returns over the entire study period, median returns, standard deviation in returns, and extreme scores. Returns have been calculated with NAVs.[12]

On average, the sample's total return is negative to -6.9%. The minimum and maximum total returns in the sample are -99% and 68.6%, respectively. These extreme return scores have been achieved by ETFs that are managed by the Nomura Asset Management company. With respect to risk, i.e., standard deviation, the average risk score of the sample is 1.4. The lowest risk score in the sample is 0.6 and the highest is 3.7. The combination of the reported returns and risks in Table 2 reveal that the chance of achieving significant raw returns when investing in Japanese ETFs is not immaterial, and possibly by being exposed to a modest investment risk. However, the possibility of losing money should not be neglected either.

This Table presents the descriptive statistics of returns for the sample's ETFs over the period 1/1/2018-

[12] We note that the data about NAVs are provided by the managing companies in yens (JPY). Returns in Table 2 have been calculated in US$ after converting JPY NAVs into US$ using the relevant daily close exchange rates between JPY and US$.

12/31/2022. The presentation is made per the managing company of the ETFs examined and for the entire sample. Returns are calculated in Net Asset Value (NAV) terms.

**Table 2.** Returns of ETFs

| BlackRock Japan - 11 ETFs | Total Ret | Av. Ret | Med. Ret | St.Dev | Min | Max |
|---|---|---|---|---|---|---|
| Mean | 0.313 | 0.009 | 0.039 | 1.378 | -11.889 | 9.451 |
| Min | -18.387 | -0.011 | -0.010 | 1.019 | -20.683 | 5.704 |
| Max | 45.264 | 0.045 | 0.133 | 1.838 | -7.741 | 13.236 |
| Nikko Asset Management - 16 ETFs | | | | | | |
| Average | -3.053 | 0.005 | 0.038 | 1.306 | -10.300 | 8.323 |
| Min | -33.552 | -0.031 | -0.038 | 0.652 | -20.474 | 3.915 |
| Max | 46.043 | 0.045 | 0.137 | 1.767 | -4.157 | 13.292 |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | | | |
| Average | -5.112 | 0.003 | 0.021 | 1.244 | -11.024 | 8.520 |
| Min | -23.688 | -0.020 | -0.022 | 0.644 | -20.484 | 4.179 |
| Max | 28.541 | 0.032 | 0.097 | 1.502 | -4.352 | 13.257 |
| Nomura Asset Management - 38 ETFs | | | | | | |
| Average | -10.970 | -0.002 | 0.015 | 1.473 | -12.344 | 9.013 |
| Min | -98.996 | -0.095 | -0.081 | 1.093 | -98.222 | 5.169 |
| Max | 68.626 | 0.060 | 0.200 | 3.737 | -6.544 | 26.431 |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | | | |
| Average | -7.712 | 0.002 | 0.015 | 1.305 | -14.163 | 10.037 |
| Min | -13.828 | -0.005 | 0.013 | 1.166 | -20.459 | 6.857 |
| Max | -1.596 | 0.009 | 0.016 | 1.443 | -7.868 | 13.217 |
| Sample -76 ETFs | | | | | | |
| Average | -6.891 | 0.002 | 0.024 | 1.392 | -11.740 | 8.900 |
| Min | -98.996 | -0.095 | -0.081 | 0.644 | -98.222 | 3.915 |
| Max | 68.626 | 0.060 | 0.200 | 3.737 | -4.157 | 26.431 |

## 4. Empirical Results

### *4.1 Single-factor Performance Analysis*

The results of the single-factor performance regression analysis are presented in Table 3. The Table includes the average, minimum and maximum alpha and beta estimates, along with R-squared values on the explanatory power of the model. The results are presented on a "per managing company" basis.

The average alpha is slightly negative at -0.001. Moreover, there are 35 positive alphas, none of which is statistically significant. On the other hand, there are 41 negative alphas with only one of them being statistically significant. These results indicate that the Japanese ETFs cannot offer above market returns. In addition, there is not any managing company in Japan that is capable of achieving superior returns to the benefit of investors.

Based on these results, we may conclude that return superiority cannot be a selection criterion for investors when examining which Japanese ETFs to invest in or which managing company to select. Other factors that can affect this decision include the quality of services provided, the range of products offered by each company, and the costs charged by each company.[13] In any case, based on the insignificant estimates of excess market returns, we conclude that that the Japanese equity ETFs may be suitable for investors who seek to get access to the stock market of Japan in a relatively safe mode, without, however, expecting impressive market returns.

This Table presents the results of a single-factor performance regression model via which the daily excess return (return minus risk free rate) of each ETF is regressed on the excess return of the index constructed by Fama and French for the Japanese stock market. Alpha reflects the above-market return that can be achieved by an ETF. Beta counts for the systematic risk of ETFs. The estimation period spans from 1/1/2018 to 12/31/2022.

[13] We see in Table 1 that, in terms of trust fees, the cheapest company is BlackRock Japan, whose average trust fee amounts to 14 bps. The most expensive company is Nomura Asset Management with an average trust fee of 33 bps.

**Table 3.** Single-Factor Performance Regression Results

| BlackRock Japan - 11 ETFs | alpha | beta | R^2 |
|---|---|---|---|
| Mean | 0.006 | 0.534 | 0.233 |
| Min | -0.014 | 0.363 | 0.182 |
| Max | 0.042 | 0.636 | 0.364 |
| Sign>0 | 0 | 11 | |
| Insign>0 | 6 | 0 | |
| Sign<0 | 0 | 0 | |
| Insign<0 | 5 | 0 | |
| Nikko Asset Management - 16 ETFs | | | |
| Mean | 0.002 | 0.492 | 0.213 |
| Min | -0.036 | 0.105 | 0.133 |
| Max | 0.042 | 0.634 | 0.362 |
| Sign>0 | 0 | 16 | |
| Insign>0 | 9 | 0 | |
| Sign<0 | 1 | 0 | |
| Insign<0 | 6 | 0 | |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | |
| Mean | 0.000 | 0.490 | 0.222 |
| Min | -0.025 | 0.088 | 0.125 |
| Max | 0.029 | 0.632 | 0.357 |
| Sign>0 | 0 | 9 | |
| Insign>0 | 4 | 0 | |
| Sign<0 | 0 | 0 | |
| Insign<0 | 5 | 0 | |
| Nomura Asset Management - 38 ETFs | | | |
| Mean | -0.005 | 0.508 | 0.198 |
| Min | -0.099 | 0.186 | 0.166 |
| Max | 0.056 | 0.728 | 0.358 |
| Sign>0 | 0 | 38 | |
| Insign>0 | 15 | 0 | |
| Sign<0 | 0 | 0 | |
| Insign<0 | 23 | 0 | |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | |
| Mean | -0.001 | 0.487 | 0.220 |
| Min | -0.008 | 0.359 | 0.180 |
| Max | 0.006 | 0.614 | 0.360 |
| Sign>0 | 0 | 2 | |
| Insign>0 | 1 | 0 | |
| Sign<0 | 0 | 0 | |
| Insign<0 | 1 | 0 | |
| Sample -76 ETFs | | | |
| Mean | -0.001 | 0.506 | 0.209 |
| Min | -0.099 | 0.088 | 0.125 |
| Max | 0.056 | 0.728 | 0.364 |
| Sign>0 | 0 | 76 | |
| Insign>0 | 35 | 0 | |
| Sign<0 | 1 | 0 | |
| Insign<0 | 40 | 0 | |

When it comes to systematic risk, the average beta is equal to 0.506 showing that the Japanese ETFs are rather conservative compared to the market portfolio. At the managing company level, the BlackRock's ETFs present the highest average beta, which is equal to 0.534.[14] The low betas imply that ETF investors are relatively protected

[14] At this point, we must note that we have also run model (1) with the Nikkei 225 Index as the market portfolio. The results on alphas

during down markets. In other words, during such periods, the losses incurred by these conservative ETFs will be quite lower by those displayed by the general Japanese stock market. However, during uprising markets, the conservatism of the Japanese ETFs results in lower gains for ETFs compared to the profits realized in the broad stock market.

Given the analysis above, beta estimates can serve as a selective tool for ETF investors. More specifically, aggressive investors, who are in seek for products that can help them beat the market by assuming increased risk, will choose among ETFs whose betas are higher than unity compared to the market portfolio. On the other hand, conservative investors wishing to protect themselves during bearish markets should focus on ETFs with lower systematic risk than market risk.

### *4.2 Six-Factor Performance Analysis*

The results of the six-factor performance regression model (2) are provided in Table 4. The Table presents the average, minimum and maximum alpha and beta estimates and the corresponding figures for the rest explanatory variables of the model. R-squared values are reported too.

The average alpha of the sample is 2 bps. However, similar to alphas obtained from the single-factor model, the majority of estimates are statistically insignificant. Therefore, the inability of the Japanese ETFs to beat the market portfolio revealed via the single-factor regression analysis is verified by the multi-factor analysis too. The average estimate of systematic risk (beta) obtained from model (2) is slightly higher than that derived from model (1) at 0.519. In any case, the conservatism of the Japanese ETFs shown in the previous section is re-confirmed. Compared to the results of the single-factor model in the previous section, no new inferences are to be drawn via applying the multi-factor model (2) with respect to the ability of Japanese ETFs to offer above market returns and their conservatism.

When it comes to the size factor, model (2) produces an average SMB estimate of 0.050. Moreover, 23 significantly positive and 29 significantly negative estimates are obtained. Therefore, the size factor is quite significant in explaining the performance of the Japanese ETFs. However, the impact by the size factor is fund-specific rather than being monotonic.

Similar trends are displayed by the value factor. More specifically, model (2) offers 24 and 31 significantly positive and negative estimates, respectively, with the average HML coefficient being equal to -0.026. Thus, the impact of the value factor on performance of ETFs traded in Japan is considered to be fund-specific.

Going further, a rather negative relationship is established between the return of ETFs and the robustness (*RMW*) factor. 31 out of 76 *RMW* estimates are significantly negative and only 3 are significantly positive. The rest estimates are insignificant. The average term of the *RMW* estimates is -0.201. This means that an increase in the value factor by 1% can result in lower ETF returns by 0.2%. Overall, a negative *RMW* value means that companies of lower profitability achieve lower stock returns too. Based on our results, we may infer that the majority of the ETF examined are exposed to companies with low profitability.

This Table presents the results of a six-factor performance regression model via which the daily excess return of each ETF is regressed on the excess return of the index constructed by Fama and French for the Japanese stock market, and the Fama & French (2015) SMB (small minus big) factor, HML (high minus low book-to-price ratio) factor, the RMW (robust minus weak) factor, the CMA (conservative minus aggressive) factor, and the Carhart (1997) MOM (momentum) factor. The estimation period spans from 1/1/2018 to 12/31/2022.

are similar to these reported in Table 3. However, betas are even lower than those obtained when using the market portfolio created by Fama and French for Japan.

**Table 4.** Six-Factor Performance Regression Results

| BlackRock Japan - 11 ETFs | alpha | beta | SMB | HML | RMW | CMA | MOM | R^2 |
|---|---|---|---|---|---|---|---|---|
| Mean | 0.007 | 0.537 | -0.010 | -0.095 | -0.211 | -0.016 | 0.043 | 0.246 |
| Min | -0.011 | 0.376 | -0.104 | -0.383 | -0.419 | -0.311 | -0.161 | 0.096 |
| Max | 0.041 | 0.634 | 0.264 | 0.237 | 0.266 | 0.245 | 0.151 | 0.376 |
| Sign>0 | 0 | 11 | 1 | 1 | 0 | 3 | 6 | |
| Insign>0 | 6 | 0 | 1 | 2 | 2 | 3 | 2 | |
| Sign<0 | 0 | 0 | 0 | 5 | 6 | 1 | 1 | |
| Insign<0 | 5 | 0 | 9 | 3 | 3 | 4 | 2 | |
| Nikko Asset Management - 16 ETFs | | | | | | | | |
| Mean | 0.003 | 0.497 | 0.032 | -0.041 | -0.166 | -0.043 | 0.053 | 0.230 |
| Min | -0.034 | 0.129 | -0.100 | -0.394 | -0.345 | -0.578 | -0.049 | 0.151 |
| Max | 0.041 | 0.634 | 0.263 | 0.428 | 0.483 | 0.317 | 0.152 | 0.374 |
| Sign>0 | 0 | 16 | 3 | 4 | 2 | 8 | 8 | |
| Insign>0 | 9 | 0 | 6 | 2 | 1 | 1 | 3 | |
| Sign<0 | 1 | 0 | 0 | 6 | 8 | 5 | 0 | |
| Insign<0 | 6 | 0 | 7 | 4 | 5 | 2 | 5 | |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | | | | | |
| Mean | 0.002 | 0.499 | 0.092 | -0.087 | -0.133 | 0.070 | 0.076 | 0.250 |
| Min | -0.023 | 0.120 | -0.097 | -0.423 | -0.371 | -0.224 | -0.037 | 0.191 |
| Max | 0.028 | 0.645 | 0.419 | 0.285 | 0.171 | 0.312 | 0.155 | 0.383 |
| Sign>0 | 0 | 9 | 3 | 3 | 0 | 5 | 7 | |
| Insign>0 | 4 | 0 | 2 | 0 | 3 | 1 | 0 | |
| Sign<0 | 0 | 0 | 0 | 5 | 4 | 0 | 0 | |
| Insign<0 | 5 | 0 | 4 | 1 | 2 | 3 | 2 | |
| Nomura Asset Management - 38 ETFs | | | | | | | | |
| Mean | -0.001 | 0.528 | 0.058 | 0.014 | -0.235 | -0.014 | 0.078 | 0.227 |
| Min | -0.094 | 0.168 | -0.183 | -0.564 | -0.858 | -0.638 | -0.149 | 0.126 |
| Max | 0.055 | 0.733 | 0.304 | 0.480 | 0.314 | 0.719 | 0.250 | 0.370 |
| Sign>0 | 0 | 38 | 15 | 15 | 1 | 11 | 24 | |
| Insign>0 | 16 | 0 | 10 | 5 | 5 | 11 | 8 | |
| Sign<0 | 0 | 0 | 4 | 14 | 18 | 8 | 3 | |
| Insign<0 | 22 | 0 | 9 | 4 | 14 | 8 | 3 | |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | | | | | |
| Mean | 0.002 | 0.499 | 0.161 | -0.013 | -0.091 | 0.006 | 0.126 | 0.235 |
| Min | -0.004 | 0.372 | 0.046 | -0.268 | -0.301 | -0.206 | 0.099 | 0.095 |
| Max | 0.009 | 0.627 | 0.277 | 0.242 | 0.119 | 0.219 | 0.152 | 0.375 |
| Sign>0 | 0 | 2 | 1 | 1 | 0 | 1 | 2 | |
| Insign>0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | |
| Sign<0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | |
| Insign<0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | |
| Sample -76 ETFs | | | | | | | | |
| Mean | 0.002 | 0.519 | 0.050 | -0.026 | -0.201 | -0.010 | 0.069 | 0.233 |
| Min | -0.094 | 0.120 | -0.183 | -0.564 | -0.858 | -0.638 | -0.161 | 0.095 |
| Max | 0.055 | 0.733 | 0.419 | 0.480 | 0.483 | 0.719 | 0.250 | 0.383 |
| Sign>0 | 0 | 76 | 23 | 24 | 3 | 28 | 47 | |
| Insign>0 | 36 | 0 | 20 | 9 | 12 | 16 | 13 | |
| Sign<0 | 1 | 0 | 4 | 31 | 37 | 14 | 4 | |
| Insign<0 | 39 | 0 | 29 | 12 | 24 | 18 | 12 | |

Finally, with respect to the relationship between the performance of ETFs and the momentum factor, the results indicate a rather positive impact. The average MOM estimate is 0.069. Moreover, there are 50 out of 76 single estimates that are positive, with the majority of them (47 estimates) being statistically significant. This positive relationship indicates that the rising prices of ETFs tend to rise further and falling prices tend to keep falling. This empirical trend can be the basis of profitable investment strategies involving Japanese ETFs. In addition, the positive relationship between performance and the momentum factor can be quite helpful during recessing stock markets as it can alarm investors about possible future losses and, thus, help them decide about remaining in the market or not.

As far as the Conservative Minus Aggressive (*CMA*) factor is concerned, the results reveal a rather inconclusive trend. In particular, 44 estimates are positive, of which 28 are statistically significant. In addition, there are 14 significantly negative *CMA* coefficients. The average estimate is negative at -0.010. Based on these results, the impact on ETFs' performance by the conservativeness factor is significant but the sign of the impact is not unique.

To summarize this section, the multi-factor regression analysis of performance shows that the Japanese ETFs cannot beat the market portfolio. Given the passive nature of the sample's ETFs, the non-achievement of significant above market returns is not surprising. This phenomenon may be empowered by the conservativeness of the Japanese ETFs, as inferred by the low betas compared to market portfolio. Finally, the five factors suggested by Fama and French (1993 & 2015) and Carhart (1997) can explain a significant portion of ETFs' performance. In the case of size, value and conservativeness, the sign and the magnitude of these factors' impact on performance is rather fund specific. In the case of robustness, the relationship with performance is negative. The opposite is the case between the performance and the momentum factor.

### *4.3 Risk-Adjusted Returns*

This risk-adjusted returns of the Japanese ETFs are discussed in this section. The estimates of the Sharpe, Treynor and Modigliani-Modigliani ratios are found in Table 5.

This Table presents three types of ETFs' risk-adjusted return, i.e., the Sharpe Ratio, Treynor Ratio (Treynor Ratio I is computed with beta from the single-factor performance regression model and Treynor Ratio II is computed with beta from the six-factor performance regression model), and the Modigliani-Modigliani (MM) Ratio over the period 1/1/2018 to 12/31/2022.

**Table 5.** Risk-Adjusted Return of ETFs

| BlackRock Japan - 11 ETFs | Sharpe | Treynor I | Treynor II | M&M |
|---|---|---|---|---|
| Mean | 0.001 | 0.008 | 0.008 | 0.007 |
| Min | -0.017 | -0.032 | -0.031 | -0.013 |
| Max | 0.024 | 0.076 | 0.079 | 0.032 |
| >0 | 6 | 6 | 6 | 7 |
| <0 | 5 | 5 | 5 | 4 |
| Nikko Asset Management - 16 ETFs | | | | |
| Mean | -0.003 | -0.018 | -0.013 | 0.002 |
| Min | -0.056 | -0.352 | -0.286 | -0.059 |
| Max | 0.024 | 0.077 | 0.080 | 0.033 |
| >0 | 6 | 6 | 6 | 10 |
| <0 | 10 | 10 | 10 | 6 |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | |
| Mean | -0.005 | -0.028 | -0.020 | 0.000 |
| Min | -0.040 | -0.288 | -0.212 | -0.040 |
| Max | 0.018 | 0.054 | 0.056 | 0.026 |
| >0 | 3 | 3 | 3 | 4 |
| <0 | 6 | 6 | 6 | 5 |
| Nomura Asset Management - 38 ETFs | | | | |
| Mean | -0.005 | -0.010 | -0.008 | 0.000 |
| Min | -0.027 | -0.218 | -0.206 | -0.025 |
| Max | 0.030 | 0.179 | 0.198 | 0.039 |
| >0 | 12 | 12 | 12 | 17 |
| <0 | 26 | 26 | 26 | 21 |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | |
| Mean | -0.003 | -0.003 | -0.003 | 0.002 |
| Min | -0.009 | -0.018 | -0.017 | -0.005 |
| Max | 0.003 | 0.011 | 0.011 | 0.008 |
| >0 | 1 | 1 | 1 | 1 |

| | | | | |
|---|---|---|---|---|
| <0 | 1 | 1 | 1 | 1 |
| Sample -76 ETFs | | | | |
| Mean | -0.003 | -0.011 | -0.008 | 0.001 |
| Min | -0.056 | -0.352 | -0.286 | -0.059 |
| Max | 0.030 | 0.179 | 0.198 | 0.039 |
| >0 | 28 | 28 | 28 | 39 |
| <0 | 48 | 48 | 48 | 37 |

On average, the Sharpe ratios are slightly negative at -0.003. At the fund level, 28 ETFs in the sample present positive Sharpe ratios and 48 present negative such ratios. Similar results are obtained for Treynor ratios. The average Treynor I (using betas from the single-factor model) and Treynor II (employing betas from the multi-factor model) are equal to -0.011 and -0.008, respectively. In each version of Treynor ratio, 28 estimates are positive and 48 are negative. Finally, the average M&M ratio is essentially equal to zero. In addition, 39 M&M ratios are positive and 37 are negative.

Overall, the majority of risk-adjusted returns are negative (with the exception of M&M ratios). Therefore, we may infer that the Japanese ETFs fail to provide investors with excess returns to compensate them for the risk they assume. This inference is in line with the conclusions reached by the single- and multi-factor analysis of ETFs in the previous sections.

### *4.4 Market Timing Analysis*

The market timing skills of ETF managers are discussed in this section. The results of the Treynor and Mazuy (1966) model are presented in Table 6. Alphas and betas of the model are similar to those obtained from the performance regression analysis in the previous sections. Gammas are significantly positive for 16 ETFs and significantly negative for 25 ETFs. These number indicate that about 21% of the sample's ETFs can time the market. We remind that in the case of the passively managed ETFs in our sample, time the market entails that the managers timely respond to changes in the synthesis of the underlying market index. At the managing company level, BlackRock Japan seems to be the more skillful among the examined companies (with a portion of 36,36%, that is 4 out of 11, significantly positive gamma estimates).

This Table presents the results of the Treynor and Mazuy (1966) Model on the timing ability of ETF managers. The ETFs' daily excess return is regressed on the excess return of the index constructed by Fama and French for the Japanese stock market and the squared excess returns of this index. The timing ability implies that the managers of ETFs can respond to the movements of the stock market and revise the portfolios they manage in an efficient and timely manner. The timing ability is assessed via regression's gamma.

**Table 6.** Market Timing Regression Results I

| BlackRock Japan - 11 ETFs | alpha | beta | gamma | R^2 |
|---|---|---|---|---|
| Mean | -0.003 | 0.535 | 0.007 | 0.237 |
| Min | -0.075 | 0.360 | -0.029 | 0.083 |
| Max | 0.041 | 0.630 | 0.071 | 0.365 |
| Sign>0 | 0 | 11 | 4 | |
| Insign>0 | 6 | 0 | 0 | |
| Sign<0 | 0 | 0 | 4 | |
| Insign<0 | 5 | 0 | 3 | |
| Nikko Asset Management - 16 ETFs | | | | |
| Mean | 0.005 | 0.492 | -0.002 | 0.215 |
| Min | -0.044 | 0.106 | -0.029 | 0.034 |
| Max | 0.041 | 0.629 | 0.038 | 0.363 |
| Sign>0 | 0 | 16 | 3 | |
| Insign>0 | 8 | 0 | 3 | |

| | | | | |
|---|---|---|---|---|
| Sign<0 | 1 | 0 | 8 | |
| Insign<0 | 7 | 0 | 2 | |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | |
| Mean | 0.009 | 0.488 | -0.007 | 0.225 |
| Min | -0.039 | 0.090 | -0.029 | 0.027 |
| Max | 0.040 | 0.629 | 0.038 | 0.358 |
| Sign>0 | 0 | 9 | 2 | |
| Insign>0 | 7 | 0 | 0 | |
| Sign<0 | 1 | 0 | 3 | |
| Insign<0 | 1 | 0 | 4 | |
| Nomura Asset Management - 38 ETFs | | | | |
| Mean | -0.004 | 0.508 | -0.001 | 0.200 |
| Min | -0.100 | 0.188 | -0.028 | 0.017 |
| Max | 0.040 | 0.725 | 0.060 | 0.360 |
| Sign>0 | 0 | 38 | 7 | |
| Insign>0 | 23 | 0 | 9 | |
| Sign<0 | 1 | 0 | 9 | |
| Insign<0 | 14 | 0 | 13 | |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | |
| Mean | 0.017 | 0.484 | -0.014 | 0.222 |
| Min | 0.010 | 0.357 | -0.014 | 0.081 |
| Max | 0.023 | 0.611 | -0.014 | 0.362 |
| Sign>0 | 0 | 2 | 0 | |
| Insign>0 | 2 | 0 | 0 | |
| Sign<0 | 0 | 0 | 1 | |
| Insign<0 | 0 | 0 | 1 | |
| Sample -76 ETFs | | | | |
| Mean | 0.000 | 0.505 | -0.001 | 0.212 |
| Min | -0.100 | 0.090 | -0.029 | 0.017 |
| Max | 0.041 | 0.725 | 0.071 | 0.365 |
| Sign>0 | 0 | 76 | 16 | |
| Insign>0 | 46 | 0 | 12 | |
| Sign<0 | 3 | 0 | 25 | |
| Insign<0 | 27 | 0 | 23 | |

The results of the Jagannathan and Korajczyk (1986) model are provided in Table 7. On average, alphas are positive at 0.011. However, with only 6 significantly positive exceptions, all other estimates are insignificant or significantly negative (3 cases). Beta estimates are slightly higher than those obtained from the regression analysis of performance (at an average of 0.616).

This Table presents the results of the Jagannathan and Korajczyk (1986) Model on the timing ability of ETF managers. The ETFs' daily excess return is regressed on the excess return of the index constructed by Fama and French for the Japanese stock market and the squared and cubic excess returns of this index. The timing ability implies that the managers of ETFs can respond to the movements of the stock market and revise the portfolios they manage in an efficient and timely manner. The timing ability is assessed via the regression's gamma whereas delta coefficient assesses the ability of managers to time the volatility of the stock market.

**Table 7.** Market Timing Regression Results II

| BlackRock Japan - 11 ETFs | alpha | beta | gamma | delta | R^2 |
|---|---|---|---|---|---|
| Mean | 0.011 | 0.670 | -0.006 | -0.015 | 0.268 |
| Min | -0.060 | 0.386 | -0.042 | -0.024 | 0.084 |
| Max | 0.054 | 0.773 | 0.057 | -0.003 | 0.397 |
| Sign>0 | 1 | 11 | 1 | 0 | |
| Insign>0 | 8 | 0 | 3 | 0 | |
| Sign<0 | 0 | 0 | 6 | 10 | |

| | | | | | |
|---|---|---|---|---|---|
| Insign<0 | 2 | 0 | 1 | 1 | |
| Nikko Asset Management - 16 ETFs | | | | | |
| Mean | 0.015 | 0.601 | -0.012 | -0.012 | 0.241 |
| Min | -0.046 | 0.085 | -0.042 | -0.024 | 0.037 |
| Max | 0.055 | 0.771 | 0.017 | 0.002 | 0.395 |
| Sign>0 | 3 | 16 | 0 | 1 | |
| Insign>0 | 10 | 0 | 6 | 0 | |
| Sign<0 | 1 | 0 | 8 | 14 | |
| Insign<0 | 2 | 0 | 2 | 1 | |
| Mitsubishi UFJ Kokusai Asset Management - 9 ETFs | | | | | |
| Mean | 0.019 | 0.589 | -0.016 | -0.011 | 0.248 |
| Min | -0.038 | 0.100 | -0.042 | -0.020 | 0.028 |
| Max | 0.054 | 0.770 | 0.021 | -0.001 | 0.390 |
| Sign>0 | 1 | 9 | 2 | 0 | |
| Insign>0 | 6 | 0 | 0 | 0 | |
| Sign<0 | 1 | 0 | 6 | 7 | |
| Insign<0 | 1 | 0 | 1 | 2 | |
| Nomura Asset Management - 38 ETFs | | | | | |
| Mean | 0.007 | 0.615 | -0.010 | -0.012 | 0.221 |
| Min | -0.085 | 0.181 | -0.041 | -0.023 | 0.017 |
| Max | 0.053 | 0.867 | 0.042 | 0.005 | 0.392 |
| Sign>0 | 1 | 38 | 4 | 1 | |
| Insign>0 | 25 | 0 | 6 | 1 | |
| Sign<0 | 1 | 0 | 20 | 34 | |
| Insign<0 | 11 | 0 | 8 | 2 | |
| Norinchukin Zenkyoren Asset Management - 2 ETFs | | | | | |
| Mean | 0.024 | 0.556 | -0.020 | -0.008 | 0.238 |
| Min | 0.021 | 0.382 | -0.025 | -0.013 | 0.082 |
| Max | 0.026 | 0.731 | -0.016 | -0.003 | 0.393 |
| Sign>0 | 0 | 2 | 0 | 0 | |
| Insign>0 | 2 | 0 | 0 | 0 | |
| Sign<0 | 0 | 0 | 1 | 1 | |
| Insign<0 | 0 | 0 | 1 | 1 | |
| Sample -76 ETFs | | | | | |
| Mean | 0.011 | 0.616 | -0.011 | -0.012 | 0.235 |
| Min | -0.085 | 0.085 | -0.042 | -0.024 | 0.017 |
| Max | 0.055 | 0.867 | 0.057 | 0.005 | 0.397 |
| Sign>0 | 6 | 76 | 7 | 2 | |
| Insign>0 | 51 | 0 | 15 | 1 | |
| Sign<0 | 3 | 0 | 41 | 66 | |
| Insign<0 | 16 | 0 | 13 | 7 | |

Furthermore, similar to the Treynor and Mazuy model, the model of Jagannathan and Korajczyk produces a number of positive gammas (22). However, only 7 of them are statistically significant. The majority of gammas (41 estimates) are significantly negative. Based on these results, the inference about the existence of market timing skills on behalf of some ETF managers shown via the Treynor and Mazuy model is slightly verified by that of Jagannathan and Korajczyk. Finally, when it comes to the skills to time the volatility of the stock market, the results on deltas indicate a clear inability of ETF managers in this field. 73 delta estimates are negative, of which 66 are statistically significant.

## 5. Conclusion

This study examines the performance of 76 equity ETFs that trade on the stock market of Japan. The study covers the period 1/1/2018-12/31/2022. Performance is computed with a range of methods including raw returns, alphas deriving from single- and multi-factor regression models, and risk-adjusted returns calculated with the Sharpe, Treynor and Modigliani-Modigliani (M&M) ratios. In the last step, the market timing skills of the Japanese ETF managers are evaluated.

The results show that the Japanese ETFs cannot produce any above-market returns. The risk-adjusted returns are not glowing either. This inference concerns all the managing companies considered in our analysis. On the other hand, the risk of these ETFs is quite low. This inference applies both to raw risk and systematic risk. With respect to the latter, the empirical findings indicate that equity ETFs in Japan are significantly more conservative than the market portfolio. This element might contribute to ETFs not achieving any material above market returns.

When it comes to the risk factors used to evaluate the performance of ETFs, the results show that the size, value, robustness, conservativeness and momentum factors are valuable variables in explaining the performance of the Japanese ETFs. In particular, the impact of robustness is negative. The opposite applies to the momentum factor. The relationship of the rest variables is significant but inconclusive, i.e., not monotonic.

Finally, the assessment of the ETF managers' market timing skills reveals that about one fifth of the sample's ETFs are capable of timing the market. However, this ability does not concern the volatility of the market.

Overall, our study indicates that investing in Japanese ETFs can occasionally be quite profitable. However, significant excess returns are not to be expected. Based on these results, we may assume that the Japanese equity ETFs are suitable for conservative investors who wish to get exposure to the stock market in a relatively safe mode, without, however, aiming at spectacular returns that will exceed the average returns of the market.

In any case, investors in Japanese ETFs should take into account the trends in the overall stock market and the prospects of the country in general. For the moment, the expectations are for a steadily growing economy, an increased consumer spending due to the increased wages that have been recently negotiated, and an ongoing accommodative fiscal policy by the government. These positive economic prospects can result in a bullish stock market in Japan, even though the market could face increasing volatility in the short term owing to speculation over monetary policy.

ETF investors address these positive expectations by increasing the cash inflows in Japanese ETF products, as noted recently.[15] However, ETF investors should also keep in mind the factors or risks that can affect the return prospects of their investments. These factors concern both upside and downside risks, which depend on the path of economy.

Upside risks regard the growing optimism over virtuous cycle of wage increases and mild inflation, the prolonged accommodative monetary policy by the BOJ, the further improvement of the corporate governance practices of the listed companies, and the embracing of favorable policies towards environment and society. On the other hand, downside risks relate to the possible tighter fiscal policy by the government in order to achieve a surplus of primary balance, the possibility for excessive and rapid appreciation of JPY, the monetary tightening by the BOJ, and political risks triggered by the split of the ruling Liberal Democratic Party in Japan.

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[15] According to a report by ETFGI, ETFs industry in Japan gathered 385.68 million US Dollars in net inflows during June 2024. Source: https://etfgi.com/news/press-releases/2024/07/etfgi-reports-etfs-industry-japan-gathered-38568-million-us-dollars-net.

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## Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

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