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Contrarian Profits in Thailand Sustainability Investment-Listed versus in Stock Exchange of Thailand-Listed Companies

Parichat Sinlapates and Surachai Chancharat *

Faculty of Business Administration and Accountancy, Khon Kaen University, Khon Kaen 40002, Thailand
* Correspondence: csurac@kku.ac.th

Abstract: In contrarian trading, investors buy and sell loser stocks (lowest average historical prices) and winner stocks (highest average historical prices), respectively. This study examines whether (a) Thailand Sustainability Investment-listed companies outperform Stock Exchange of Thailand (SET)-listed companies (from 1 January 2016 to 31 December 2019) in contrarian profits, (b) the five-factor model outperforms their 1993 three-factor model in explaining contrarian profits, and (c) risk drives the earnings of contrarians. Companies were divided into portfolios of winners and losers based on the average of the daily historical prices held in various eras. The SET-listed companies perform better in generating profits. The root mean squared error and mean absolute error—measurements of model accuracy—report that the error from the three-factor model is smaller than the one from the five-factor model. Thus, the three-factor model is applied to estimate the risk-adjusted return. Zero contrarian profits after risk adjustment confirms that they are risk-driven.

Keywords: contrarian profits; ESG; risk; asset pricing model

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1. Introduction

Environmental, social, and governance (ESG) have gained significant attention from both industry and academia. ESG engagement and business performance are expected to be positively correlated. Financial institutions promised to take ESG considerations into account when making investment decisions (Chen et al. 2022). Inspired by a rising trend of investing with a social conscience. As a result, this study attempts to investigate the profitability of trading strategies, including historical stock returns and business ESG information by developing the contrarian trading strategies with ESG information.

Allocating stocks based on their historical prices is one of the most popular investment styles known as the contrarian trading strategy. This allocation of stocks to different styles is termed style investing. Barberis and Shleifer (2003) claim that classifying stocks into groups and allocating their funds amongst various asset groups is the most prevailing approach in portfolio management. Some investment styles are relatively long-term (inactive after a long-term performance), whereas others are short-term. A style disappears when the market is more efficient relative to it (Cao 2011). Both individual and institutional investors benefit from investment styles for many reasons. For example, Mullainathan (2002) explains that classification simplifies complex investment choices and allows the efficient processing of a large volume of information. Allocating funds to multiple styles is better than selecting listed stocks from thousands of them. Sharpe (1992) also claims that classifying assets into categories enables investors to assess the performance of financial management because styles automatically generate peer groups characterised by the same style.

In contrarian trading strategy, characterised by style investing, investors sell past winner stocks (highest prices' stocks) and buy past loser stocks (lowest prices' stocks) (Jegadeesh 1990). This trading strategy operates against the prevailing market trends by selling and buying high-performing and poor-performing assets, respectively. Contrarian investors contend that excessive optimism among investors might result in stock market

mispricing. In a contrarian trading strategy, also known as the reversal trading strategy, investors take a long position for past loser stocks and a short position for past winner stocks. The contrarian profit has been observed globally (Blitz et al. 2013; Chen and Yang 2020; Naeem et al. 2022), including in Thailand (Lerskullawat and Ungphakorn 2019; Pokavattana et al. 2019). In light of the global investment trend, this study examines the profitability of contrarian trading strategies with ESG information in Stock Exchange of Thailand (SET).

The extant literature shows that contrarian trading strategies can generate profit internationally. The contrarian profits should be explained by overreaction hypothesis (De Bondt and Thaler 1985). Although, the overreaction may not be the only reason for contrarian profits and risk is another aspect that might explain contrarian profits. However, there are a few studies on contrarian trading strategies in the SET especially the study of ESG information and risk. In order to close the gap, this study addresses three key research goals. The first aim examines whether there is a contrarian profit among ESG companies. If yes, is the observed profits outperform the contrarian profit from SET. The second is to examine whether across all Thai listed companies in order to compare the performance of Fama and French's (1993) three-factor model with Fama and French's (2015) five-factor model in explaining the observed profits. The last goal is to determine if the reported contrarian profits are risk-driven by employing an appropriate model to analyze the data. This study sheds a new light in ESG contrarian trading strategies and presents an investment option for the investors in the SET.

The article starts with introduction, followed by a Literature Review and Hypotheses Development, and the methodology and a sample description in Section 3. Section 4 highlights the results and the discussion have been provided in Section 5 while Section 6 concludes the study.

2. Literature Review and Hypotheses Development

Owing to the existence of contrarian profits, many researchers have explored the contrarian trading strategy. For example, Fama (1965) and Lehmann (1990) explored the negative serial correlation of stock returns over a short horizon (less than a year), whereas Fama and French (1988) explored the negative serial correlation in a long horizon (beyond a year) returns. Jegadeesh (1990) also examined the predictive power of monthly returns on individual stocks and found that the stock prices are inconsistent with the random walk model. The predictability of returns on individual stocks could be attributed to (a) stock market inefficiencies or (b) systematic changes in the estimated returns. In a weekly observation, Lehmann (1990) showed that companies with negative returns tend to have positive returns in the following week, and those with positive returns tend to have negative returns in the following week. Since winning shares are possible to change into wasting shares in the upcoming and vice versa, Lehmann (1990) agreed with Conrad et al. (1997) that the contrarian trading strategy may be beneficial. Conrad and Kaul (1998) stated that momentum profit is observed when a medium-term investment horizon (3–12 months), whereas contrarian profit is observed in a long-term investment horizon.

De Bondt and Thaler (1985), Lo and MacKinlay (1990), and Jegadeesh and Titman (1995) also confirmed and explained the existence of contrarian profits. De Bondt and Thaler (1985) provided evidence to support the overreaction hypothesis. They found that the loser portfolios outperform the winner portfolios in a period of 36 months. Lo and MacKinlay (1990) explained that overreaction might not be the only explanation of contrarian profits; instead, they showed that the contrarian profits are mainly due to a systematic lead-lag relation between returns of portfolios, which are formed on the basis of size. Jegadeesh and Titman (1995) also discovered that the lead-lag effect played a minor role in the contrarian profits, which were primarily attributable to the overreaction of stock prices to firm-specific news. There was unanimity in the findings of Lo and MacKinlay (1990) and Jegadeesh and Titman (1995) that overresponse is not the main description for contrarian profits. Another possible factor to explain contrarian profits is risk. The contrarian strategy exhibits dynamic exposures, which are likely to negatively affect the profits and contribute

to risk (Chen and De Bondt 2004) on the Fama and French's (1993) three-factor model. Blitz et al. (2013) introduced a short-term residual contrarian strategy (stocks are ranked based on historical residual returns), which they suggest generates significantly higher and more stable profits than the conventional contrarian strategy.

Contrarian profit exists globally, including in Thailand. Using SET trading data from 1988 to 2007, Kamtip (2010) confirmed the existence of contrarian profit. Lerskullawat and Ungphakorn (2019) investigated the stock price overreactions in the SET from 1990 to 2016. There is an evidence of stock price overreaction, particularly during the financial crisis such as the subprime crisis during 2008–2009. Chen and Yang (2020), however, show that investors often overestimate company ESG information, resulting in ESG momentum effects in financial markets. Specifically, investors react positively to good news about firms with higher ESG ratings but negatively to bad news about companies with lower ESG scores. Consistent with the overreaction hypothesis, the empirical data suggest that an ESG momentum approach can yield in significant gains in the short-term, but the contrarian profits can yield only in the long-term. Chen et al. (2022) found that that the ESG momentum approach can lead to increased profits in the Taiwanese market, but it cannot lead to significant gains in the Japanese market. Furthermore, in the Taiwanese market, the ESG momentum impact might endure up to three years following portfolio building. In the Japanese market, the ESG contrarian approach may outperform the ESG momentum strategy in terms of profitability. Pokavattana et al. (2019) agreed that a low-performing portfolio outperforms the winner portfolio during the long-term investment horizon. The investor overreaction in the SET is an opportunity for contrarian profits. The contrarian trading strategy is chosen when investing in the SET.

In their investment decision-making, SET-listed companies consider ESG factors. Likewise, both domestic and international investors focus on ESG factors and consider them a responsible investment. From 2015, the SET has been developing listed companies' quality towards sustainable growth and then including them in the Thailand Sustainability Investment (THSI) list. According to the conventional financial theory, low risk stocks lead to lower returns. Ashwin Kumar et al. (2016), however, find that ESG stocks show lower volatility in their performance compared to their peers in the same industry. These ESG stocks also generate a higher return over a period of 2 years from 1 January 2014 to 31 December 2015, including 157 companies listed on the Dow Jones Sustainability Index. Nagy et al. (2016) apply an ESG momentum trading strategy from 2007 to 2015 using Morgan Stanley Capital International (MSCI)'s ESG data. The strategy outperforms the global benchmark over the sample period. Fatemi et al. (2018) also found that ESG strengths increase the value of the companies.

Both the developed and emerging markets were examined. Sherwood and Pollard (2017), for example, study ESG stocks within emerging market trading strategies, and find significantly great results based on ESG integration. In the other words, integrating ESG emerging market stocks into institutional portfolios generate higher returns than non-ESG stocks investments. Conversely, Taechaubol (2017) finds the opposite result in the SET. Taechaubol (2017) conducts a study on how the SET announces THSI-listed companies and finds significantly negative abnormal returns of the THSI list. The ambiguous results from previous studies lead to further studies in the ESG areas. Thus far, there is no study on contrarian profits in ESG stocks in Thailand, thus leaving gaps for further studies. This study compares contrarian profits for SET-listed and THSI-listed companies. SET focuses on ESG factors in investment decision-making, an effort it regards as a responsible investment, which draws the interests of international investors. Since 2015, SET has been developing the THSI list of companies based on meeting sustainable growth requirements indicated by an outstanding performance on ESG. There are few studies on ESG stocks, especially in the context of trading strategies in SET. This study explores contrarian trading strategies and ESG stocks in SET.

Although the existing literature focuses on profitability of contrarian trading strategies, comparison of contrarian profits between THSI- and SET-listed companies is lacking. This study addressed the following research questions:

(1) Do THSI-listed companies outperform all listed companies to generate contrarian profits?

To answer the first research question, all SET- and THSI-listed companies are grouped into high- and low-performing stocks based on their historical prices. THSI-listed companies are renowned for their excellent performance on ESG, which attracts investors because such a performance is associated with higher returns. This following hypothesis was developed:

H_1. *Profitability of contrarian trading strategy from THSI-listed companies outperforms profitability of contrarian trading strategy from all SET-listed companies.*

(2) Does the observed contrarian profit (if any) risk explain the contrarian profit in the SET?

Choosing a suitable asset pricing model among several asset pricing models to investigate the relationship between contrarian profit and risk is an important research topic. To explain market anomalies such as contrarian profits, the existing literature shows that the multifactor model generally outperforms the one-factor model. Fama and French's (1993) three-factor model is widely used as a multifactor asset pricing model to estimate future returns. Recently, the Fama and French's (2015) five-factor model was introduced to improve the performance of the three-factor model. Consequently, the five-factor model is expected to outperform the three-factor model in justifying the examined contrarian profits. This leads to a second testable hypothesis:

H_2. *The observed contrarian earnings are better explained by the five-factor model than by the three-factor model.*

Overreaction is not the only explanation of contrarian profits (Jegadeesh and Titman 1995). Another possible factor to explain contrarian profits could be risk. If so, there should be a statistically significant relationship between the observed contrarian profits and time-varying risk. The contrarian profits are expected to disappear after controlling for risk. This leads to a third testable hypothesis that:

H_3. *The profits made by contrarian bets can be attributed to time-varying risk.*

3. Methodology and Sample Description

3.1. Methodology

3.1.1. Comparing the Profitability of Contrarian Trading Strategy of THSI- and SET-Listed Companies (Test H_1)

Sample stocks (both sample groups: THSI- and SET-listed companies) are categorised into deciles based on historical prices. The time frames for portfolio development are 15, 30, 60, and 90 days. The portfolios are created using the mean prices over the formation period. After calculating their average values, the sample stocks are evenly divided into ten portfolios and then arranged in ascending order. We take into account the two most extreme portfolios (portfolios 1 and 10). The contrarian trading approach holds long positions in portfolios of losers and short positions in portfolios of winners. These roles are filled simultaneously. Thereafter, portfolios are held for six periods: 1, 7, 15, 30, 60, and 90 days. The following describes the test statistic:

$$t = \frac{\overline{x} - \mu}{s/\sqrt{n}} \quad (1)$$

where $\overline{x}$ denotes mean of the portfolio returns, μ denotes mean of population—which is zero—s denotes standard deviation, and n denotes the sample size—which is firm-day

observations. This test shows that the average portfolio returns are equal to zero, thus accepting the null hypothesis. To examine whether THSI-listed companies outperform all SET-listed companies in generating contrarian profits, the test statistic in Equation (1) is applied. In particular, the observed contrarian profits from THSI companies minus the observed contrarian profits from all SET companies are used in this objective.

If the result is positive and shows a high non-zero value, then THSI-listed companies outperform all SET-listed companies in generating contrarian profits. If otherwise, the SET-listed companies outperform THSI-listed companies.

3.1.2. Contrasting the Three- and Five-Factor Models (Test H_2)

Selecting a suitable asset pricing model from a variety of asset pricing models to examine the relationship between contrarian profit and risk is an essential research subject deserving of consideration in order to explore whether contrarian profit is determined by risk. To explain market anomalies such as contrarian profits, previous studies suggest two asset pricing models: the Fama and French's (1993) three-factor and the Fama and French's (2015) five-factor models. The Fama and French's (1993) three-factor model consist of market factor[1], size factor[2], and value factor[3]. Fama and French's (2015) claim that the five-factor model enhances the performance of the three-factor model by adding two more factors: profitability[4] and investment[5]. However, the extant literature suggests that the five-factor model fails to capture some returns' patterns; for example, it fails to capture low returns on small stocks. According to the literature, there is no evidence whether the five-factor model outstrips the three-factor model in explaining the contrarian profit, especially in the SET. Therefore, the extent of implementation of both models remains sketchy. The three-factor model of Fama and French's (1993) is described as:

$$C_t = \alpha_t + \beta_t^{RmRf} RmRf_t + \beta_t^{SMB} SMB_t + \beta_t^{HML} HML_t + \varepsilon_t \quad (2)$$

where C_t represents contrarian profits on day t; $RmRf_t$ symbolizes market excess return on day t; SMB_t denotes size factor on day t; and HML_t denotes value factor on day t; α_t, β_t^{RmRf}, β_t^{SMB} and β_t^{HML} are parameters to be estimated. ε_t denotes the residual on day t. The SMB and HML factors from the three-factor model are calculated as follow:

$$\text{SMB} = \frac{(Small\ Value + Small\ Neutral + Small\ Growth)}{3} + \frac{(Big\ Value + Big\ Neutral + Big\ Growth)}{3} \quad (3)$$

$$\text{HML} = \frac{(Small\ Value + Big\ Value)}{2} + \frac{(Small\ Growth + Big\ Growth)}{2} \quad (4)$$

The five-factor model is described as:

$$\begin{aligned} C_t = \alpha_t &+ \beta_t^{RmRf} RmRf_t + \beta_t^{SMB} SMB_t + \beta_t^{HML} HML_t \\ &+ \beta_t^{RMW} RMW_t + \beta_t^{CMA} CMA_t + \varepsilon_t \end{aligned} \quad (5)$$

where RMW_t represents the profitability factor on day t, and CMA_t represents investment factor on day t. β_t^{RMW} and β_t^{CMA} are estimated parameters. ε_t is the residual on day t. The factors from the five-factor model are calculated as follow:

$$\text{SMB}_{\text{value}} = \frac{(Small\ Value + Small\ Neutral + Small\ Growth)}{3} + \frac{(Big\ Value + Big\ Neutral + Big\ Growth)}{3} \quad (6)$$

$$\text{SMB}_{\text{profit}} = \frac{(Small\ Robust + Small\ Neutral + Small\ Weak)}{3} + \frac{(Big\ Robust + Big\ Neutral + Big\ Weak)}{3} \quad (7)$$

$$\text{SMB}_{\text{invest}} = \frac{(Small\ Conser + Small\ Neutral + Small\ Aggressive)}{3} + \frac{(Big\ Conservative + Big\ Neutral + Big\ Aggressive)}{3} \quad (8)$$

$$\text{SMB}_{\text{profit}} = \frac{(\text{SMBvalue} + \text{SMBprofit} + \text{SMBinvest})}{3} \quad (9)$$

$$\text{HML} = \frac{(Small\ Value + Big\ Value)}{2} + \frac{(Small\ Growth + Big\ Growth)}{2} \tag{10}$$

$$\text{RMW} = \frac{(Small\ Robust + Big\ Robust)}{2} + \frac{(Small\ Weak + Big\ Weak)}{2} \tag{11}$$

$$\text{CMA} = \frac{(Small\ Conservative + Big\ Conservative)}{2} + \frac{(Small\ Aggressive + Big\ Aggressive)}{2} \tag{12}$$

To test H_2, the implementation of both three-factor and the five-factor models must be compared. The root mean squared error (RMSE) and mean absolute error (MAE)—the two measurements of model accuracy—are used to estimate the models. These errors are estimated as follows:

$$\text{RMSE}\left(C_t, \hat{C}_t\right) = \sqrt{\frac{1}{n_{samples}} \sum_{i=0}^{n_{samples}-1} \left(C_t - \hat{C}_t\right)^2} \tag{13}$$

$$\text{MAE}\left(C_t, \hat{C}_t\right) = \frac{1}{n_{samples}} \sum_{i=0}^{n_{samples}-1} \left|C_t - \hat{C}_t\right| \tag{14}$$

where C_t is the actual contrarian profit on day t, $\hat{C}_t$ is the estimated contrarian profit on day t utilizing (a) the three-factor model and (b) the five-factor model, and $n_{samples}$ is the number of the observed sample. The finest possible values of RMSE and MAE are 0.0.

3.1.3. Contrarian Profit and Risk (Test H_3)

An appropriate asset pricing model from the preceding section is used to test if the risk component of contrarian profit is present. Compared to high-performing equities, losers typically carry higher risks, but these increased risks are offset by larger returns. Using the two-tailed test from Equation (1), the risk-adjusted returns are used to examine the significance of statistics of the hedge-portfolio return (return from long positions minus short position portfolios). There is no proof of a risk-adjusted contrarian benefit if the outcome reveals that the mean risk-adjusted returns in hedge portfolios are insignificant. The statistically insignificant result shows that a contrarian profit cannot be produced by risk-adjusted returns, indicating that risk is what determines a contrarian profit. On the other hand, the statistically significant result shows that risk cannot account for the contrarian profit.

3.2. Sample Description

Stocks that are included in the sample are those that are listed in SETSMART[6]. The sample period starts from 1 January 2016 to 31 December 2019. Valid stocks for the sample are those with at least 36 days' of returns data. The data of Fama and French's (1993) three-factor and Fama and French's (2015) five-factor models are constructed as in French's (2019) webpage[7].

Table 1 shows descriptive statistics of portfolio formation variables including the price and return (for both SET- and THSI-listed companies). The overall sample includes 586,215 firm-day observations (for all SET-listed companies) and 59,956 firm-day observations (for THSI-listed companies). The total number of all SET companies is 667 and for THSI companies is 63. Both the price and return of all SET-listed companies have a larger standard deviation compared to THSI-listed companies due to a wider range of observations.

Table 1. Data description for portfolio formation variables.

Variables	Min	Max	Mean	Median	S.D.	Number of Observations	Number of Companies
Price (all listed)	0.00	3928	23.70	5.95	92.97	586,215	667
Price (THSI)	0.00	588	56.59	25.25	85.06	59,956	63
Return (all listed)	−0.51	1.16	0.00	0.00	2.82	586,215	667
Return (THIS)	−0.37	0.51	0.03	0.00	1.83	59,956	63

Table 2 presents a descriptive statistic and correlation of Fama and French factors: market (Rm-Rf), size (SMB3 for three-factor model and SMB5 for the five-factor model), value (HML), profitability (RMW), and investment factors (CMA). The daily Fama and French data include 977 observations. The correlation coefficients among Fama and French factors are statistically insignificant, indicating different economic insights.

Table 2. Data description for Fama and French factors.

Fama and French Factors	Min	Max	Mean	Median	S.D.	Number of Observations
Rm-Rf	−3.15	4.58	0.02	0.05	0.69	977
SMB3	−0.03	0.02	0.00	0.00	0.01	977
SMB5	−0.02	0.02	0.00	0.00	0.00	977
HML	−1.10	1.47	0.00	0.00	0.32	977
RMW	−1.81	1.96	0.03	−0.01	0.45	977
CMA	−1.27	1.59	0.02	0.01	0.34	977
Correlation						
Rm-Rf	1.00					
SMB3	0.02	1.00				
SMB5	0.02	0.55	1.00			
HML	−0.01	0.08	−0.03	1.00		
RMW	−0.10	0.00	0.03	−0.38	1.00	
CMA	−0.03	0.08	0.05	−0.11	0.35	1.00

Note: Rm-Rf represents market factor; SMB3 represents size factor for the three-factor model; SMB5 represents size factor for the five-factor model; HML represents value factor; RMW represents profitability; and CMA represents investment factors.

4. Results

4.1. Evaluating the Profitability of Contrarian Trading Strategy for THSI-Listed and SET-Listed Companies

Table 3 presents the differences in contrarian profit between THSI-listed (denoted by THSI) and SET-listed companies (denoted by ALL). The difference between the two samples is measured by contrarian profit from THSI-listed companies minus all SET-listed companies, which is represented by TH-ALL. The tests for the significant difference of contrarian profit between these listed companies are reported in this table. The results are negative and statistically significant for all formation and holding periods, suggesting that the SET-listed companies outperform THSI-listed companies in generating contrarian profits. The negative excess returns are generated from contrarian profits of all SET-listed companies.

Table 3. A comparison of contrarian profits between THSI-listed and all SET-listed companies.

Holding (Days)		Portfolio Formation (Days)			
		15	**30**	**60**	**90**
1	THSI	0.02%	0.03%	0.06%	0.06%
	ALL	1.48%	3.68%	5.46%	4.97%
	TH-ALL	−1.46% *	−3.65% ***	−5.40% ***	−4.91% ***
7	THSI	0.04%	0.05%	0.05%	0.04%
	ALL	0.87%	1.74%	2.22%	1.95%
	TH-ALL	−0.83% **	−1.68% ***	−2.16% ***	−1.91% ***
15	THSI	0.05%	0.06%	0.06%	0.05%
	ALL	0.68%	1.16%	1.26%	1.21%
	TH-ALL	−0.63% ***	−1.11% ***	−1.20% ***	−1.16% ***
30	THSI	0.06%	0.05%	0.05%	0.05%
	ALL	0.52%	0.75%	0.73%	0.72%
	TH-ALL	−0.47% ***	−0.70% ***	−0.67% ***	−0.67% ***
60	THSI	0.06%	0.06%	0.08%	0.05%
	ALL	0.27%	0.29%	0.37%	0.35%
	TH-ALL	−0.21% **	−0.23% **	−0.29% ***	−0.30% ***
90	THSI	0.07%	0.08%	0.04%	0.02%
	ALL	0.18%	0.27%	0.26%	0.18%
	TH-ALL	−0.11%	−0.20% **	−0.22% ***	−0.16% **

Note: *, ** and *** denote the statistical significance levels of 10%, 5% and 1% respectively.

These results suggest that H_1 is rejected because THSI-listed companies generate inferior contrarian profits than all SET-listed companies, the performance that is attributable to the size of the sampled companies. THSI companies have a larger market capitalization compared to SET companies. Risk associated with the company's size might be attributable to the performance. Given that investors generally earn contrarian profits, they would prefer SET-listed companies because they outperform THSI-listed companies in generating contrarian profits. The next question should entail the explanation of the observed contrarian profits. According to Jegadeesh and Titman (1995), overresponse is not the main reason for contrarian earnings. Risk may also be a role in the explanation of contrarian earnings.

4.2. Comparing the Three-Factor and the Five-Factor Models

Using RMSE and MAE, Table 4 compares the three-factor and five-factor models. The ideal RMSE and MAE values are both zero. Due to their excellent track record of producing profitable contrarian trades, the formation periods of 30, 60, and 90 days as well as the holding periods of 7 and 15 are used in this test. The RMSE and MAE in both holding periods (7 and 15 days) have a bigger error from the five-factor model once the 30 days' formation time is applied, indicating that the five-factor model is less effective than the three-factor model in explaining the contrarian profits.

Similar outcomes were also attained throughout the creation phases of 60 and 90 days. The three-factor model beats the five-factor model in describing contrarian profits, according to the decreased RMSE and MAE errors in the three-factor model compared to the five-factor model. In every holding time, the same outcomes are obtained (7 and 15 days). According to the reasoning above, H_2 is disproved since the three-factor model is more effective at explaining the observed contrarian profits in the SET than the five-factor model. In order to generate a risk-adjusted return and determine whether risk is a factor in explaining contrarian profits, the three-component model is used.

Table 4. A comparison of the three-factor and five-factor models.

Formation (Days)	Holding (Days)	Fama and French Model	Measurement of Model Accuracy	
			RMSE	MAE
30	7	Three-factor	11.83	7.53
		Five-factor	19.70	9.40
	15	Three-factor	11.93	5.39
		Five-factor	12.42	6.12
60	7	Three-factor	12.09	8.06
		Five-factor	26.79	10.65
	15	Three-factor	8.63	5.16
		Five-factor	17.39	6.11
90	7	Three-factor	11.27	7.55
		Five-factor	26.45	10.15
	15	Three-factor	8.20	4.92
		Five-factor	17.27	5.86

4.3. Contrarian Profit and Risk

The three-factor model outstrips the five-factor model in explaining contrarian profits, according to the model accuracy measurement. Risk-adjusted contrarian earnings are shown in Table 5. Winner is the portfolio's mean risk-adjusted return at the highest historical price. Loser is an indicator of the portfolio's average risk-adjusted return at the smallest historical price. The average risk-adjusted returns from loser portfolios minus winning portfolios, or L-W, is used to calculate the risk-adjusted contrarian profit. The holding periods are 1, 7, 15, 30, 60, and 90 days, while the formation periods are 15, 30, 60, and 90. After risk-adjusted returns, contrarian profits created when portfolios are based on 15 days of historical return vanish.

Table 5. Risk-adjusted contrarian profit.

Holding (Days)		Portfolio Formation (Days)			
		15	30	60	90
1	Winner	−0.09%	−0.08%	−0.07%	−0.09%
	Loser	−0.29%	0.14%	0.13%	0.34%
	L-W	−0.19%	0.23%	0.20%	0.42%
7	Winner	−0.02%	−0.08%	−0.08%	−0.09%
	Loser	−0.23%	−0.06%	0.45%	0.41%
	L-W	−0.20%	0.02%	0.53%	0.50%
15	Winner	−0.08%	−0.07%	−0.08%	−0.09%
	Loser	1.12%	0.02%	0.36%	0.42%
	L-W	1.20%	0.09%	0.44%	0.50%
30	Winner	−0.06%	−0.07%	−0.08%	−0.08%
	Loser	−0.02%	0.06%	0.14%	0.11%
	L-W	0.04%	0.13%	0.22%	0.18%
60	Winner	−0.08%	−0.08%	−0.08%	−0.08%
	Loser	0.02%	0.07%	0.02%	0.02%
	L-W	0.10%	0.15%	0.10%	0.10%
90	Winner	−0.07%	−0.08%	−0.08%	−0.09%
	Loser	0.11%	0.12%	0.04%	0.03%
	L-W	0.18%	0.19%	0.12%	0.12%

Particularly, all holding durations have a non-zero and statistically insignificant value for the risk-adjusted hedge portfolios (L-W). The formation of winner and loser portfolios using the average of previous prices for 30, 60, and 90 days yields outcomes that are similar. According to these findings, there is no proof of risk-adjusted contrarian profits. In other words, after adjusting for risk, the observed contrarian profits vanish. Hence, risk could be one of the factors to explain contrarian profits. This finding also supports the finding in Table 5 that all listed companies outperform THSI-listed companies in generating contrarian profits. If contrarian profit is driven by risk, all SET-listed companies must outperform THSI-listed companies. THSI-listed companies contain lower risk, mainly attributable to the size of companies. Overall findings (from Table 5) support contrarian profits, which vanish when risk is controlled. Consequently, risk drives contrarian gains, which is why H_3 is accepted.

5. Discussion

This study contributes to the literature by (a) comparing the observed contrarian profits between all SET-listed and THSI-listed companies; (b) comparing the performance of Fama and French's (1993) three-factor and Fama and French's (2015) five-factor models in explaining the observed contrarian profits; and (c) examining, using an appropriate model, whether the examined contrarian profits are driven by risk. The sample stocks (taken from 1 January 2016 to 31 December 2019) are categorised into high-performing and low-performing portfolios based on the average historical prices. The high-performing and low-performing portfolios are held for six different periods: 1, 7, 15, 30, 60, and 90 days. The finding shows that the contrarian profits are not significantly observed when portfolios are formed on THSI companies during the short-term holding period. This result is consistent with Chen and Yang (2020). They found that only an ESG momentum profits in the short-term holding period and reverse to contrarian profits in long-term holding period. Pokavattana et al. (2019) are also confirm that the contrarian profits could be observed in long-term investing. However, when the sample are switched to SET-listed companies, the short-term contrarian profits are observed as same as the finding of Lerskullawat and Ungphakorn (2019). The study finds that all SET-listed outperform THSI companies in generating contrarian profits. The next question should consider the explanation of the observed contrarian profits why contrarian profits are difference between THIS and SET-listed companies.

Overreaction is generally known as one of the possible explanations of contrarian profits; however, it is not the only explanation of contrarian profits (Jegadeesh and Titman 1995). Another possible factor to explain contrarian profits is risk. To construct risk-adjusted return, the appropriate asset pricing model should be applied. The measurements of model accuracy report that the error in the three-factor model is smaller than in the five-factor model. Consequently, the three-factor model is employed to calculate approximately risk-adjusted returns. The contrarian profits vanish when risk is taken into account, demonstrating that risk is what drives contrarian profits in the SET. This finding consists with Jegadeesh and Titman (1995). If risk is the possible factor to explain the contrarian profits, it is not surprise that why significant contrarian profits do not be observed when portfolios are form on THSI companies. The THSI companies are considered the top ESG companies, where investors are seeking the long run return with a low level of risk. Thus, if the contrarian profits are driven by risk, the statistically significant contrarian profits should not be found when the portfolios are form on THSI companies.

6. Conclusions

Numerous practical implications have been offered by this work. Our finding demonstrates that the contrarian profits disappear after controlling for risk. As a consequence, the overreaction is not the only factor to explain the observed contrarian profits in SET but risk is also one of another possible factors. The finding also shows that the contrarian profits from ESG companies are significantly low. If risk is one of the main factors to create

the earning from the contrarian trading strategies, lowering the contrarian profits implies lowering the risk. Thus, the ESG companies carry a lower level of risk comparing to the SET overall. It can be applied to direct the creation of financial policies. These findings can give businesses helpful pointers when deciding how to allocate their ESG investments in terms of management consequences. Companies have sufficient justifications for using their resources to improve their ESG and to raise the expectations of their stakeholders because our study reveals that there is no immediate harmful impact or disadvantage from engaging in ESG activities. In general, businesses with sound ESG policies can enhance their stakeholders' willingness to invest in them.

Although this research produced valuable data, it has certain drawbacks. These should be seen as possibilities for additional investigations into this subject. The main drawback of this study is that e ESG metrics were used as a stand-in for sustainable development objectives due to the study's scope; nevertheless, there are other metrics that may be used to analyze sustainable development practices. Future research may also make use of other rating services like the Dow Jones Sustainability Indices. The second constraint results from the small number of samples. Of the THIS-listed firms, we could only use the data from 63 of them because it is available in SETSMART. The sample size may have been increased, nevertheless, to get more significant results. The likelihood that additional factors could influence the relationships between ESG and financial success is the final research restriction. For instance, the relationship might be impacted by variables impacting the business environment or level of competition. Future studies will focus on these topics.

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Notes

1 The excess return on the market.

2 SMB is the difference between an average return on the three small portfolios and an average return on the three big portfolios. The size is defined by market capitalization.

3 HML is the difference between an average return on the two value portfolios and an average return on the two growth portfolios. The value is defined by the book-to-market ratio.

4 RMW is the difference between an average return on the two robust operating profitability portfolios and an average return on the two weak operating profitability portfolios. The profitability is defined by operating profits.

5 CMA is the difference between average return on the two conservative investment portfolios and an average return on the two aggressive investment portfolios. The investment is defined by the change of total assets.

6 The data that support the findings of this study are available from the corresponding author upon reasonable request via https://drive.google.com/drive/folders/1U_dIkq71GKzj_fWwUru-nnOeNwONQjc3?usp=sharing (accessed on 5 April 2020).

7 URL: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html and https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_5_factors_2x3.html (accessed on 5 April 2020).

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