PROFITABILITY OF CONTRARIAN STRATEGIES: EVIDENCE FROM THE STOCK EXCHANGE OF MAURITIUS

Ushad Agathee Subadar*
University of Mauritius, Mauritius

Muhammad Anas Hossenbaccus A.R.
University of Mauritius, Mauritius

Abstract. *The aim of this paper is to assess the profitability of contrarian strategies on the Stock exchange of Mauritius. Using data from 2001 till 2009 for all 40 listed companies on the official market, the study shows little support in favour of the contrarian effect. In particular, the losers portfolio seems to outperform the winners portfolio in one out of nine strategies. However, when considering the market return, negative excess returns are noted for all portfolios across all strategies, providing strong support for a passive portfolio management strategy and weak support for overreaction hypothesis. In addition, the Size, Price, Earnings to Price (E/P) and Book to Market (B/M) Effect has been tested. The results suggest that the average market return is greater than size-based portfolios and price-based portfolios. However, when accounting for the E/P and the B/M effect, there seems to be a strategy which can beat the market. Nevertheless, most strategies for E/P and B/M portfolios indicate insignificant excess returns. In general, the results of this paper are undoubtedly in sharp contrast with most popular studies in developed markets. However, it is observed that investors on the SEM may not possess similar characteristics to those of well-advanced markets. In particular, according to Harvey (1995), emerging market countries are sometimes relatively isolated from capital markets of other countries.*

Key words: *contrarian, efficient market hypothesis, stock market, African markets, Mauritius*

1. Introduction

Several studies[1] have investigated the profitability of trading strategies that exploit interdependence of time-series returns and show that these strategies could lead to excess returns. In this respect, De Bondt and Thaler (1985) presented a controversial study that has seriously threatened the validity of the weak-form efficient market hypothesis. They found that long-term past losers (lowest-return stocks) outperform long-term

* Corresponding author. Mailing address: Finance and Accounting Department, Faculty of Law and Management, University of Mauritius, Reduit, Mauritius. Phone No. +230 4037516. E-mail: *u.subadar@uom.ac.mu*

[1] Campbell & Limmack (1997), Baytas & Caciki (1999), Zamri & Simon (2001), Jegadeesh & Titman (2001) amongst others.

past winners (positive or highest return stocks) over the subsequent three to five years. Stocks with poor three-to-five year past performance seem to earn higher average returns than stocks that have performed well in the past. They demonstrated that an arbitrage portfolio of losers and winners can yield an average return of 25% over a three year period. Contrarian strategies that buy past losers and sell past winners are also called the Winners and Losers effect.

De Bondt and Thaler (1985) suggested that investors overreact to both bad news and good news thereby causing past losers to become underpriced and past winners to become overpriced. This argument is known as an overreaction hypothesis and it provides a plausible explanation to this anomaly of past losers earning relatively higher returns than past winners. In fact, economists, psychologists and analysts[2] have mostly explained return reversals by arguing that individuals or investors tend to overreact to information.

In this respect, the objective of this study is to assess whether contrarian strategies may be profitable and whether there is strong support for the overreaction hypothesis on the Stock Exchange of Mauritius (SEM). Also, the paper investigates the weak-form efficiency of the stock market by examining the profitability of a number of contrarian strategies based on size, price, earnings-to-price ratios and book-to-market of stocks.

To the authors' best knowledge, there has not been any published article on the contrarian strategies on the Stock Exchange of Mauritius. This study is therefore the first formal attempt to assess the profitability of contrarian strategies on the SEM. The study also contributes to the existing literature on the empirical evidence surrounding this anomaly in small emerging markets.

The paper is organised as follows; section 2 reviews the literature, section 3 provides an overview of the SEM, section 4 discusses the research methodology, section 5 analyses the data, while section 6 concludes the study.

2. Prior Research

There is a significant number of studies[3] which are in favor of contrarian strategies on international markets. For example, Campbell and Limmack (1997) showed that contrarian profits were possible even after 12 months following the formation of the portfolio in the UK market. Similarly, Baytas and Caciki (1999) studied long-term contrarian strategies on seven industrialized countries and found that the strategies lead to significant positive returns. Moreover, Chang, McLeavey and Rhee (1995) demonstrated short-term abnormal returns for contrarian strategies on the Japanese stock markets. They found that abnormal profits are generated both when losers are greater and smaller than winners and that there exists a significant asymmetry between the

[2] Arrow (1982), Kahneman & Tversky (1982), Chopra, et. al., (1992), Kahneman & Tversky (2000) amongst others.

[3] Mai (1995) in the French market, Alonso & Rubio (1990) in Spain and Da Costa (1994) in Brazil amongst others

performance of winners and losers. In addition, Zamri and Simon (2001) found that losers stocks within a 3 year ranking period outperform the winners stocks during the following 3 years on the Kuala Lampur Stock Exchange. Furthermore, Jegadeesh and Titman (2001) found that small firms experience return reversals and the evidence is weaker for larger ones when evaluating portfolio performance relative to Fama and French (1993) benchmark.

2.1. Explanatory Factors

De Bondt and Thaler (1985) documented that investors behave irrationally and based their arguments on the findings of Kahneman and Tversky (1982) in the field of cognitive psychology. When investors revise their prospects, they tend to overvalue new information and underestimate past information. Consequently, stock prices will move away from their fundamental values and this violates the efficient market hypothesis. This phenomenon is known as the over-reaction hypothesis. As such, initial winners will ultimately tend to be eventual losers.

Other explanations relate to change in risk of stocks during the holding period. In this respect, Chan (1988) suggested that the losers are safer at the beginning of the formation period and become more risky at the end of it while the winners are more risky at the beginning and less risky in the end. Thus, the increase in the price of losers will be accompanied by a decrease in the price of winners.

Others[4] argue that there is a size effect between the winners and losers stocks. According to Zarowin (1990), losers stocks can be considered to be from smaller companies than winners. Fama and French (1991) also supported Zarowin's (1990) viewpoint and argued that when comparing losers and winners stocks of the same relative size, the excess returns disappear.

On the other hand, Ball, Kothari and Shanken (1995) found an upward bias concerning high-priced stocks and low-priced stocks. On average, if the losers stocks have lower prices than the winners, the contrarian effect can be explained by this difference in price and not the over-reaction hypothesis.

2.2. Stock Market Anomalies and the Contrarian Effect

Apart from the contrarian effect, the efficient market hypothesis is also challenged by the size, price, Book-to-market value of equity(B/M) and Earnings-to-price (E/P) effect. Researchers[5] have shown that the average stock return of a firm is related to its size, B/M, E/P, Cash Flow-to-Price (C/P) and a few more factors. In fact, B/M and E/P are related positively to average returns while the size is negatively related.

The different anomalies listed above will be shortly described below:

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4 Zarowin (1990), Fama & French (1991), amongst others

5 Fama & French (1992), Baytas & Caciki (1999), Jegadeesh & Titman (2001), Lakonishok, Schleifer & Vishny (1994) amongst others.

Size effect

Jegadeesh and Titman (2001) documented strong evidence of return reversals for small firms, though evidence is relatively weak for large firms. The size effect is the tendency of shares having a small market capitalization to outperform companies with larger market capitalisation over the long term. This can be explained by the fact that small companies are illiquid due to their higher trading costs. However, Albert and Henderson (1995) argued that the size factor does not influence this outperformance. This result is consistent with De Bondt and Thaler (1987) study as overreaction effect is unrelated to size.

Price effect

Baytas and Caciki (1999) ranked stocks according to their average price during a period and constructed a winner and loser portfolio in the same way as Jegadeesh and Titman (1993) did for momentum portfolios. They found that the price-based portfolio significantly outperformed the size-based portfolio and the contrarian portfolio. This effect is quite similar to the size effect since price level of stocks can be considered as a size indicator.

E/P effect and B/M effect

According to Fama and French (1992), it has been found that stocks with high B/M and low P/E exhibit higher returns than those with low B/M and high P/E. In effect, Fama and French (1992) supported the claim that value strategies, portfolios of stocks with high B/M and low P/E, would earn higher return than the market thus disapproving the Efficient Market hypothesis. However, they concluded that this value premium is due to part of the risk missed by the Capital Asset Pricing Model (CAPM).

On the other hand, Lakonishok, Schleifer and Vishny (1994) were motivated to extend the research of Fama and French (1992) and studied value strategies in the US as well as in other international markets. They recognized the existence of a value premium but provided a completely different explanation than Fama and French (1992). According to them, the market overvalues growth stocks and undervalues distressed stocks. After the correction of these pricing errors by the market, distressed stocks provide a higher return than growth stocks.

3. Overview of the Stock Exchange of Mauritius

The Stock Exchange of Mauritius (SEM) was incorporated in March 1989 as a private limited company with the objective to operate a fair, transparent and liquid market. The SEM is supervised and regulated by the Financial Services Commission (FSC). The SEM has the statutory and regulatory power to enforce rules on protagonists of the exchange such as listed companies and investors for the proper functioning of the market. However, these rules must be consistent with the Securities Act 2005 and must be approved by the FSC.

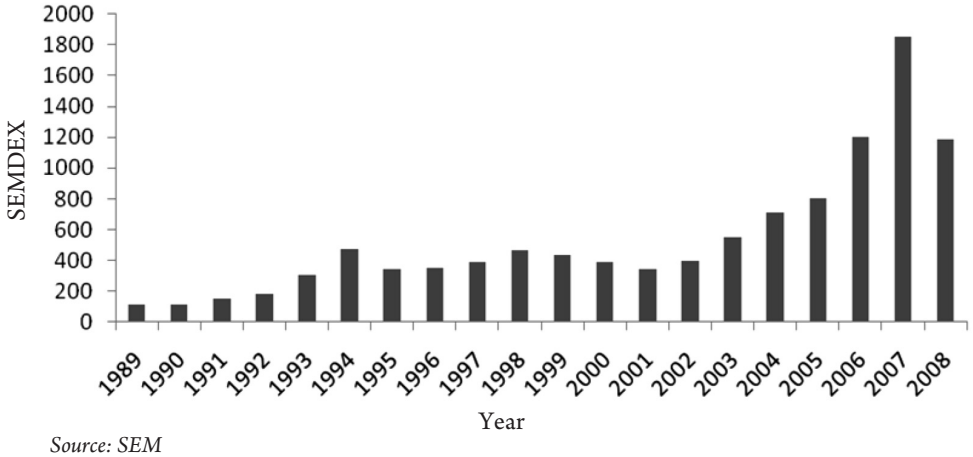
The Mauritian stock market is segregated into two markets: the Official Market and the Over-The-Counter Market (known as the development and enterprise market). As of 2009, there are 38 companies listed on the Official Market, and 49 companies quoted in the Development and Enterprise market.

The Exchange was opened to foreign investors in 1994 following the abolition of exchange controls. Thus, foreign investors can trade in shares without approval unless the investment's purpose is for legal or management control of a Mauritian company. However, there is a restriction on foreign ownership of more that 15% of shares in a sugar company.

The SEM consists of several indices which provide a clearer view of performance of the market in general. There are three market indices: the SEMDEX, the SEM-7 and the SEMTRI. The SEM-7 is considered as a benchmark to assess the performance of seven listed shares on the exchange while the SEMTRI and the SEMDEX is an important tool for market participants for performance measurement of all listed companies on the official market. It is observed that the SEMTRI is a total return index, taking into account gross dividends as well as capital gain/losses while the SEMDEX is an all price share index taking into account only price movements of all companies on the official market.

Major developments on the SEM include the setting up of the Central Depository and Settlement System (CDS) in 1997 for a prompt and efficient settlement of trade along with the SEM'S Automated Trading System (SEMATS) which is an electronic trading system built on third generation technology.

Since its inception, the SEM has developed at a reasonable speed but it still lacks some important features. The graph below shows the trend of the SEMDEX from 1989 to 2008.



Source: SEM

FIGURE 1. **Evolution of SEMDEX**

It is observed from the barchart that the SEMDEX has considerably increased since its inception. It was in the year 2001 that the SEMDEX started to increase. It can be highlighted that the SEMDEX increased from 1204 to 1852 in 2007. However, the SEMDEX recorded a major decline following the financial crisis which has globally affected stock exchanges around the world.

Nevertheless, the SEM has a liquidity problem relative to developed markets. The lack of liquidity may be due to the lack of knowledge in the field of finance by a large proportion of residents as well as to the fact that people tend to deposit most of their savings into traditional savings account. Statistics on market liquidity are shown in the table below.

TABLE 1. **Summary Statistics on Market Liquidity on the SEM**

Year	Turnover (Rs Million)	Change in Turnover (%)	Turnover Per Session (Rs)	Turover Ratio=Turnover/market capitalization (%)
1989	14		548,456	0.97
1990	89	520.87	1,735,982	2.35
1991	81	-8.24	1,624,844	1.67
1992	159	95.22	1,602,024	2.41
1993	692	336.08	7,130,171	4.64
1994	1,520	119.77	10,340,021	5.15
1995	1,221	-19.7	8,191,953	4.39
1996	1,602	31.22	10,822,199	4.8
1997	2,997	87.11	18,731,048	8.11
1998	2,556	-14.71	10,306,789	5.64
1999	1,978	-22.61	7,912,721	4.74
2000	2,045	3.39	8,280,352	5.52
2001	3,292	60.98	13,383,781	10.24
2002	1,723	-47.68	6,945,652	4.46
2003	2,989	73.53	11,861,803	5.83
2004	2,819	-5.69	11,098,521	4.21
2005	4,548	61.33	18,264,988	5.68
2006	5,992	31.76	23,873,498	5.12
2007	11,826	97.35	47,302,086	6.83
2008	11,405	-3.55	45,989,424	10.43

Source: SEM FACTBOOK 2009

The highest turnover ratio is only around 10%. Although there was a significant increase in turnover from 1989 till 2008, it was only in 2005 that there was a significant and sustainable improvement in market liquidity.

3.1. Data

The data analyzed in this study are the end of month prices of all shares listed on the official market of the Stock Exchange of Mauritius for the period January 2001 to December 2009. However, the longest period required is obtained by means of the analysis of the R12-H36 strategy under which the data of the past 12 months are used for ranking and the portfolio is subjected to a holding period of 36 months. All firms which are listed on the official market during this period are included in the sample. In particular, this amounts to 40 stocks and the required data is collected from the site of Associated Brokers Ltd: *http://www.abrl.net.* It is worth noting that in 2008, the SEM reported 40 listed companies.

4. Research Methodology

4.1. Construction of Contrarian Portfolios

The methodology used follows the study of Jegadeesh and Titman (1993). The strategies select stocks based on their returns over the past three to twelve months with holding periods that range from three months to three years.

The strategy selects stocks on the basis of their returns over the past R months and holds them for H months and is as follows: At the beginning of each month t, the stocks are ranked in descending order on the basis of their returns in the past R months. Based on these rankings, two portfolios are formed that equally weight the stocks contained in the top quintile (highest 20% of the stocks in the sample, i.e. 8 shares) and the bottom quintile. The top quintile is the "winners" portfolio (P1) while the bottom one is the "losers" portfolio (P2). The returns of the two equally weighted portfolios of the winners and losers (AR_i) are then recorded during the holding period.

The Average Abnormal Return (AAR) of the two portfolios is also calculated and is as follows:

$$AAR_i = AR_i - R_m \qquad (1)$$

where R_m is the average monthly return on market portfolio (SEMDEX).

Finally, the difference between the returns of the winner and loser portfolios will be tested for its statistical significance. Also, the returns of the winner and loser portfolios will be compared with the market return to assess whether or not one can beat the market.

4.2. Anomalies

The size effect is measured by using the market capitalization of each company. The same methodology which is used for the construction of contrarian portfolios is implemented for size-based portfolios. The portfolios of losers and winners are formed after the ranking of stocks based on their market capitalization. The top 20% of stocks are

included in the winner portfolio while the bottom quintile is made up of stocks with the lowest market capitalization.

The same methodology applies to the price, E/P and B/M effect, which means that the process will be repeated on 3 occasions (along with three different indicators, i.e., price, E/P and B/M.). A total of 8 strategies implemented select stocks based on their returns over the past three to twelve months and hold them for one to twelve months.

It should be noted that the Earnings to Price ratio calculated during the period of 2001-2009 is as follows:

$$\text{E/P Ratio} = \text{EPS/Average Price of stock during the ranking period} \quad (2)$$

The B/M ratio will be calculated as follows:

$$\text{B/M Ratio} = \text{Book Value of Equity/ Market Value of Equity during the ranking period} \quad (3)$$

For each strategy, the returns of both P1 (Winner portfolio) and P2 (Loser portfolio) will be compared and it will be tested whether the strategies are more profitable than the market or not.

5. Analysis of Data

5.1. Contrarian Returns

Table 1 displays the Average Monthly Return (AR) for winners, losers and the contrarian portfolios held for holding periods that range from 6 and 36 months. T-statistics and p-values at 5% level of significance are calculated to test the hypothesis that the returns are statistically different from zero.

TABLE 2. **Average Monthly Returns**

Ranking/ Holding Period(R/H)	3/12	6/ 6	6/12	**12/6**	12/12	12/18	12/24	12/30	12/36
Winners (P1)	0.66%	0.62%	0.59%	0.28%	0.37%	0.98%	0.68%	1.07%	1.09%
t statistic	2.29	1.69	1.49	0.67	0.47	3.45	1.62	2.99	3.16
p-value	0.01	0.05	0.07	0.26	0.32	0.01	0.04	0.02	0.01
Losers (P2)	0.74%	0.65%	0.63%	1.43%	1.04%	1.02%	1.13%	1.24%	1.34%
t statistic	3.22	1.04	1.57	2.49	1.96	2.15	2.83	3.65	4.12
p-value	0.00	0.15	0.07	**0.02**	0.04	0.03	0.01	0.01	0.00
Contrarian(P2-P1)	0.08%	0.03%	0.04%	1.14%	0.67%	0.04%	0.45%	0.17%	0.25%
t statistic	0.30	0.00	0.10	2.74	1.34	0.75	1.29	0.82	1.3
p-value	0.38	0.50	0.46	**0.01**	0.11	0.24	0.12	0.22	0.13

The size of the returns of losers portfolio are found to be greater than the winners portfolio. The returns of P2 are positive and significant in all strategies except the

R6-H6 strategy which has a p-value of 0.15. On the other hand, the returns of P1 are positive but significant in only 6 strategies. The contrarian portfolio showed very low returns (0.08%, 0.03% and 0.04%) and it is deduced from their p-values that they are not significant except in one strategy, i.e. the R12-H6 strategy. This strategy ranks stocks based on their past 12 months and holds the selected winners and losers for the following 6 months. This suggests that investors follow the purchase of loser's portfolios and the selling of the winner's portfolios based on R12-H6 strategy. Its return is significant since its p-value is equal to 0.01, which is less than 0.05. In particular, the loser portfolio has the highest return (1.43%) compared to the other strategies. However, when taking into account transaction costs, such as brokerage fees, this return may seem insignificant. Specifically, brokerage fees range from 1.25% to 0.90% depending on the transaction value.

The returns of both portfolios P1 and P2 are significantly greater than zero but the superiority between P2 compared to P1 is statistically insignificant except in the R12-H6 strategy. Consequently, it is concluded that, in general, the contrarian effect does not exist on the Stock Exchange of Mauritius.

TABLE 3. **Average Abnormal Returns**

R/H	3/12	6/6	6/12	12/6	12/12	12/18	12/24	12/30	12/36
Winners (P1)	-0.72%	-0.81%	-0.84%	-1.44%	-1.25%	-0.74%	-0.91%	-0.80%	-0.59%
Losers (P2)	-0.64%	-0.78%	-0.80%	-0.29%	-0.57%	-0.70%	-0.46%	-0.63%	-0.34%
Contrarian (P2-P1)	-1.31%	-1.40%	-1.38%	-0.58%	-0.94%	-1.68%	-1.14%	-1.70%	-1.43%

Table 3 displays the average abnormal returns for 9 strategies. It is observed that the returns are all negative for all strategies including the R12-H6 strategy. This means that the return of the market as measured by the SEMDEX is greater than the return based on contrarian strategies. Thus, it is of particular importance for an investor to hold a portfolio that replicates the SEMDEX instead of implementing the contrarian strategy. In this context, it can be deduced that a passive portfolio management strategy would be better than a contrarian investment strategy.

5.2. Explanation to Findings

It is observed that the returns difference between the losers portfolio (P2) and the winners portfolio (P1) is not significant except for the R12-H6 strategy. In addition, the Average Abnormal Returns were negative for all strategies including the R12-H6 strategy, which means that the market return is better than the return based on a contrarian strategy. It is deduced that some contrarian effect notably in the R12-H6 strategy exists on the SEM but the contrarian strategy is not profitable and that a rational investor may be in a better situation if a passive portfolio management strategy could be adopted. However, the investor could also adopt other active portfolio strategies which may beat

the market, though more research needs to be done to know more on those 'profitable' strategies.

It is of particular relevance to try to shed light on the non-profitability of contrarian strategies compared to the SEMDEX. Consequently, questions about the overreaction hypothesis in Mauritius may be raised. This phenomenon has been widely studied in US and other markets and many researchers[6] have recognized its existence. However, investors on the SEM may not possess similar characteristics to those of well-advanced markets. The overreaction hypothesis states that investors become excessively optimistic over good news and extremely pessimistic over bad news. It can be argued that investors on the SEM behave rationally thus not violating Baye's rule. Hence this overreaction effect does not exist in Mauritius.

It can also be pointed out that emerging market countries are sometimes relatively isolated from capital markets of other countries. As already pointed out in the overview of this study, foreign investors are not allowed to hold more than 15% of shares in a sugar company in Mauritius. Hence foreign investors from developed markets such as the US may be reluctant to invest on the SEM. Another reason for this can be the absence of a derivatives market on the local underlyings such that there are limited risk management tools available to a potential investor on the SEM. Due to a limited number of foreign investors, a large portion of equity capital is held by local investors who may evaluate their portfolios in terms of local economic and market conditions.

Contrarian strategies are strategies that use past information on share prices in an attempt to earn a higher return than the market. Thus they are considered as being in the frame of technical analysis. Since the absence of the contrarian effect has been concluded, it is suspected that the Stock Exchange of Mauritius may be weak form efficient. However, other active portfolio management strategies such as the 'momentum' effects need to be empirically tested to support the claim of weak form market efficiency.

5.3. Anomalies

In this section, the different anomalies that exist in different markets such as the size, price, E/P and B/M effect are tested.

5.3.1. Size Effect

Initially, the size characteristics of the winners and losers portfolios are assessed and it is found that the average size of the portfolios decreases from winners to losers. In particular, the loser stocks are the small-cap, whereas winners are the largest-cap. This finding is consistent with Baytas and Cakici (1999). Therefore, the winners portfolio (P1) consists of top 20% of stocks ranked according to their size (market capitalization) while the losers portfolio (P2) is made of the bottom 20%. The table below shows the returns of the winners and losers portfolio for a total of 8 strategies. The hypothesis of

[6] De Bondt & Thaler (1985), Conrad & Kaul (1993), *Jegadeesh & Titman* (2001) amongst others.

positive returns for the 2 portfolios is tested at 5% significance level and its result is in the form of t-statistics and p-values. The difference in returns between the 2 portfolios is also statistically tested.

TABLE 4. **Size-Based Return**

Ranking/Holding	*3/1*	*3/3*	*3/12*	*6/3*	*6/6*	*6/12*	*12/6*	*12/12*
Winners (P1)	0.70%	0.98%	-0.36%	1.56%	1.19%	1.08%	0.81%	0.80%
t statistic	0.68	1.73	-0.51	2.24	1.87	2.40	2.10	1.30
p-value	0.25	0.04	0.69	0.02	0.04	0.01	0.04	0.12
Losers (P2)	0.96%	1.43%	0.02%	1.31%	1.59%	1.70%	1.91%	1.82%
t statistic	2.10	2.71	2.29	2.17	3.17	5.65	4.04	3.35
p-value	0.02	0.00	0.02	0.02	0.00	0.00	0.00	0.00
P2-P1	0.26%	0.46%	1.28%	-0.25%	0.40%	1.48%	1.11%	1.02%
t statistic	0.27	0.90	2.23	-0.34	0.64	2.20	1.41	2.91
p-value	0.39	0.19	**0.02**	0.63	0.26	**0.02**	0.10	**0.01**

It is noted form Table 4 that the returns of the losers portfolio are greater than the winners portfolio in all strategies except the R6-H3 strategy. The losers portfolio consisting of small-sized companies can provide investors with higher returns than the winners portfolio. However, this outperformance of P2 compared to P1 is statistically significant for the R3-H12, R6-H12 and R12-H12 strategy. This implies that P1 outperform P2 only in strategies where the portfolio is held for 12 months after its formation date.

TABLE 5. **Size-Based Abnormal Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners(P1)	-0.98%	-0.43%	-2.15%	0.11%	-0.24%	-0.35%	-0.73%	-0.72%
t statistic	-2.62	-1.54	-2.51	0.21	-0.90	0.45	-1.15	-0.49
p-value	0.99	0.93	0.99	0.42	0.40	0.66	0.86	0.64
Losers (P2)	-0.72%	0.02%	-0.87%	-0.14%	0.16%	0.27%	0.38%	0.30%
t statistic	-2.51	0.16	-1.28	-0.05	1.07	0.44	0.45	0.23
p-value	0.99	0.43	0.89	0.52	0.12	0.33	0.32	0.41

Table 5 displays the excess returns of the 2 portfolios compared to the SEMDEX. If the results are positive and significant, this means that the strategy that constructs portfolio based on size is more profitable than the market. In this case, the returns of P1 are all negative except for the strategy R6-H3 (0.11%) while the returns of P2 are positive in only 5 strategies out of 8. Nevertheless, all these positive excess returns are found to be insignificant, suggesting the superiority of the market return compared to the return of the size-based portfolio.

5.3.2. Price Effect

TABLE 6. **Price-Based Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners (P1)	-1.24%	-0.51%	-0.61%	-1.30%	-0.20%	-0.93%	0.62%	0.40%
t statistic	-0.84	-0.62	-1.08	-1.08	-0.25	0.18	2.33	0.66
p-value	0.79	0.73	0.85	0.85	0.59	0.43	**0.02**	0.26
Losers (P2)	0.71%	1.19%	0.52%	0.80%	1.20%	1.08%	1.13%	1.57%
t statistic	0.81	2.97	3.04	1.39	3.04	3.5	2.52	2.59
p-value	0.21	0.00	0.01	0.10	0.01	0.00	0.02	0.02
P2-P1	1.95%	1.70%	1.12%	2.10%	1.40%	2.02%	0.51%	1.17%
t statistic	1.38	2.23	2.62	1.8	1.99	2.74	0.95	2.41
p-value	0.09	0.02	0.01	0.04	0.04	0.01	0.19	0.02

Initially, the price characteristics[7] of the winners and losers portfolios are assessed and it is found that the average price of the portfolios decreases from winners to losers. In particular, the loser stocks are the low-price stocks, whereas winners are the high-price stocks. From Table 6, the losers portfolio consisting of low-priced stocks gives a superior return than the winners portfolio. The latter provides a return that is negative in most strategies except for the R12-H6 and the R12-H12 strategy. It should be highlighted that P1 gives a positive significant return only for the R12-H6 strategy. Conversely, the returns of P2 are positive in every strategy and are significant in 6 out of 8 strategies. Furthermore, the values of P2-P1 are positive in all strategies and are statistically significant in 6 out of 8 strategies. This result confirms that the losers portfolio outperforms the winners portfolio in most strategies.

If the returns of size-based and price-based portfolio are compared using Table 3 and Table 5, it is evident that price-based portfolio provides higher return than size-based portfolio. It is the losers portfolios that have been taken into account for the comparison since their values are statistically significant. This finding is consistent with the study of Baytas and Caciki (1999) in seven industrialized countries who postulated that price-based portfolios outperform the size-based and the contrarian portfolios.

Table 7 shows the excess returns of the winner and losers portfolios compared to the SEMDEX. Returns are mostly negative for both winner and losers portfolios for most strategies. Even if price-based portfolios provide a higher return than size-based portfolios, the results from Table 5 and 7 indicate that the market return is better than the returns of size-based and price-based portfolios, providing some support for the weak form market efficiency.

[7] Stocks have been adjusted for stock splits.

TABLE 7. **Price-Based Abnormal Return**

Ranking/Holding	3/1	3/3	6/3	3/12	6/6	6/12	12/6	12/12
Winners (P1)	-3.48%	-1.51%	-3.30%	-2.22%	-1.22%	-2.02%	-1.10%	-1.22%
t statistic	-2.62	-1.54	-2.51	-2.86	-1.25	-0.80	-2.50	-1.35
p-value	0.99	0.93	0.99	0.99	0.88	0.78	0.98	0.89
Losers (P2)	-1.53%	0.19%	-1.21%	-1.09%	0.18%	0.00%	-0.59%	-0.05%
t statistic	-1.23	0.21	-1.43	-2.72	0.16	0.21	-1.15	-0.05
p-value	0.89	0.42	0.18	0.99	0.43	0.42	0.86	0.52

5.3.3. Earning to Price (E/P) Effect

The performance of E/P sorted portfolio has been tested and displayed in Table 7. The winners portfolio (P1) consists of high E/P stocks while the other is made of low E/P stocks. Portfolio P1 has in its core value stocks while growth stocks form portfolio P2.

TABLE 8. **E/P Based Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners (P1)	1.08%	1.78%	1.87%	3.89%	1.86%	1.45%	1.91%	2.07%
t statistic	1.01	2.86	6.05	3.22	2.9	4.06	6.74	4.31
p-value	0.16	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Losers (P2)	-2.46%	-0.24%	-0.22%	-0.75%	-0.28%	-0.12%	**0.47%**	**0.66%**
t statistic	-1.86	-0.31	-0.7	-0.7	-0.44	-0.43	1.11	1.32
p-value	0.96	0.62	-0.75	0.75	0.66	0.66	0.16	0.12
P1-P2	3.54%	2.01%	2.09%	4.65%	2.14%	1.57%	1.45%	1.41%
t statistic	2.18	3.16	7.07	4.69	6.68	6.86	2.98	2.27
p-value	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.03

Table 8 shows that P1 generates positive returns for all strategies and are statistically significant for all strategies except the R3-H1 strategy. Conversely, all the losers portfolios (P2) are statistically insignificant. It is also important to point out that the values of P1-P2 are positive in all strategies. Thus, winners outperform losers and this difference is significant for all strategies.

Table 9 shows the excess returns of P1 and P2 compared to the SEMDEX. P2 does not yield positive excess returns for all strategies. On the other hand, P1 yields significant positive excess only for the strategy R6-H3. This implies that a portfolio consisting of high E/P stocks ranked from the past six months and held for the following three months will yield abnormal returns. In general, nearly all excess returns are insignificant supporting the claim of market efficiency in that the market cannot be beaten.

TABLE 9. **E/P Based Abnormal Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners(P1)	-0.79%	0.43%	0.58%	2.80%	0.58%	0.44%	0.54%	0.66%
t statistic	-0.47	0.45	1.39	2.64	0.78	0.39	0.93	0.73
p-value	0.67	0.32	0.09	**0.01**	0.22	0.21	0.39	0.24
Losers (P2)	-4.33%	-1.59%	-1.51%	-1.84%	-1.57%	-1.13%	-0.91%	-0.75%
t statistic	-0.36	-1.60	-3.19	-1.53	-1.65	-1.94	-0.97	-0.90
p-value	0.99	0.94	0.99	0.92	0.92	0.96	0.81	0.40

5.3.4. Book to Market (B/M) Effect

Lastly, the stocks have been analyzed in terms of B/M ratio, which is an important factor in predicting stock returns. P1 consists of high B/M stocks while P2 is made of low B/M stocks.

TABLE 10. **B/M Based Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners (P1)	1.14%	2.71%	2.93%	2.21%	2.93%	2.32%	2.66%	2.34%
t statistic	1.07	2.65	5.62	1.98	2.84	3.82	5.10	3.13
p-value	0.15	0.01	0.00	0.04	0.01	0.00	0.00	0.01
Losers (P2)	-1.14%	0.66%	-0.30%	0.14%	-0.39%	0.05%	0.58%	0.53%
t statistic	-0.98	-0.86	-1.30	0.20	-0.51	0.10	0.76	0.73
p-value	0.83	0.80	0.89	0.42	0.69	0.46	0.24	0.25
P1-P2	2.28%	2.05%	3.24%	2.07%	3.32%	2.27%	2.07%	1.81%
t statistic	1.71	2.33	4.70	2.24	2.66	3.48	1.98	2.22
p-value	0.05	0.02	0.00	0.02	0.01	0.00	0.05	0.04

It is evident from Table 10 that P1 yields positive returns which are significant in all strategies except the R3-H1 strategy. On the other hand, P2 provides positive returns in 5 out of 8 strategies but they are all statistically insignificant.

The difference in returns between P1 and P2 is worth an interpretation. The values of P1-P2 are positive in all strategies implemented and the p-values are all less or equal to 0.05. This means that the losers portfolio significantly outperforms the winners portfolio in all strategies.

The excess returns of the two portfolios relative to the SEMDEX have been computed and are presented in Table 10. The loser portfolio is not able to yield positive excess returns whereas the winner portfolio provides positive returns in all strategies. However, it is observed that the excess returns are significant only in the R6-H12 strategy.

TABLE 11. **B/M Based Abnormal Return**

Ranking/Holding	3/1	3/3	3/12	6/3	6/6	6/12	12/6	12/12
Winners(P1)	0.33%	0.50%	0.55%	1.12%	1.85%	1.18%	1.28%	0.93%
t statistic	0.31	0.65	1.08	0.09	1.66	2.13	1.41	1.07
p-value	0.38	0.26	0.15	-1.12	0.06	**0.02**	0.11	0.12
Losers (P2)	-1.95%	-1.55%	-2.69%	-0.95%	-1.47%	-1.09%	-0.79%	-0.88%
t statistic	-2.22	-2.51	-5.88	0.85	-1.67	-1.87	-1.26	-1.24
p-value	0.98	0.99	1.00	1.01	0.94	0.95	0.87	0.86

The findings are consistent with those of Fama and French (1992) and Lakonishok, Schleifer and Vishny (1994) who also found the outperformance of high E/P and B/M (distressed) stocks relative to low E/P and B/M (growth) stocks. This outperformance may be due to the fact that growth stocks are overvalued while distressed stocks are undervalued by the market. In particular, the distressed stocks will provide higher returns when these errors are corrected by the market.

6. Conclusion

The purpose of this paper has been to test the presence of the contrarian effect on the Stock Exchange of Mauritius. While the vast majority of studies have reported overwhelming contrarian profits in different markets around the world, it has been found that it is futile to implement these strategies in Mauritius. Interestingly, there exists minor evidence in favor of the contrarian effect since the losers portfolios were found to outperform the winners portfolios in only one strategy (i.e. R12-H6 strategy).

The findings of this study are inconsistent with the most popular research conducted around the world. This may be due to a difference in the market behavior of investors trading in Mauritius as market participants tend to follow 'the crowd' when trading. In particular, the market is relatively small and can be dominated by a few institutional investors. In this context, two recommendations can be made. First, investors may invest in none other than the market portfolio since contrarian strategies yield a return inferior to the market. Secondly, investors can attempt to use other active portfolio strategies such as fundamental analysis in their quest to beat the market return. In this respect, it is worth adding that a proper research on the profitability of fundamental analysis on the SEM would be a great initiative.

In addition, the study of the size, price, E/P and B/M effect has proved that the price effect is more apparent than the size effect. Conversely, the B/M and E/P effect has been found to have a greater presence and each of them consists of a strategy that has been able to beat the market. Thus an investor can choose to rank stocks based on their E/P ratio for the last 6 months, choose the first seven companies, hold them in a portfolio for the following 3 months and can earn a return which outperforms the market on average by 2.80%. Similarly, an investor can earn an average abnormal return of

1.18% based on a portfolio of 7 top stocks, ranked according to their B/M ratio for the last 6 months and held for the following 12 months.

As a matter of fact, the efficient market hypothesis in its weak form postulates that it is not possible to profit from historical prices. However, the study reveals that there are only 2 out of 40 portfolios that have beaten the market. As such, most portfolios show support for the EMH on the SEM.

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