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An Investigation into the Existence of Individual Stock Momentum in the Namibia Stock Exchange

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ABSTRACT

The objective of this study was to investigate the existence of individual stock momentum effects in the Namibian Stock Exchange (NSX). In other words, the study examined whether buying stocks which performed well in the past while selling stocks which performed badly in the past generates abnormal profits in the short term. This was done by adapting the methodology used in Jegadeesh and Titman (1993). Zero cost returns (momentum returns) were determined by subtracting the loser portfolio's average returns from the average returns of the winner portfolio for every holding period. The study sample comprised of 20 companies which traded consistently throughout the study period (January 2011- December 2019). The returns of the zero cost portfolios were mainly positive. The momentum strategy generates profits by taking a long position in the winning stocks and a short position in losing stocks. It yielded momentum profits of around 9% in individual stocks. The findings of the study indicated that individual stock momentum effects do exist in the Namibia Stock Exchange.

Keywords: *Abnormal profits, Long position, Momentum effect, Short position, Stock exchange.*

INTRODUCTION

The objective of this paper is to investigate the existence of momentum effects on individual stocks in the Namibia Stock Exchange. Momentum effect alludes to the disposition that stocks which have done well in the past will keep on performing well and stocks which performed badly in the past will continue performing poorly over a short period of time, which is 3 to 12 months.

The rest of this paper is organized as follows. Section 2 gives an overview of the empirical literature on the subject. Section 3 gives the methodology that was employed in the study. Empirical results are discussed in section 4. Section 5 gives the concluding remarks.

OVERVIEW OF EMPIRICAL LITERATURE

Individual stock momentum is a quantitative analysis of the returns from the momentum strategy (Schepper, 2017). Individual stock momentum effect was first noticed in the New York Stock Exchange and American Stock Exchange by Jegadeesh and Titman (1993). Their study covered the period 1965 to 1989. They used the strategy that selects stocks based on the past 3, 6, 9, and 12 months returns which they termed the formation period and then held them for the next 3, 6, 9 and 12 months. A total of 32 different strategies were formulated which consisted of 16 strategies for the non-overlapping holding periods and another 16 strategies for the overlapping holding periods.

They ranked stocks in ascending order at the beginning of each month based on the returns of the past J-months (the formation period) and held them for the next K-months (the holding period). The stocks were grouped in deciles, whereby the top decile stocks were allocated to the winner portfolio

and the bottom decile stocks were allocated to the loser portfolio. The student t-statistic was then used to test if the returns were statistically significant. They found that all the 32 strategies yielded positive momentum returns. Their study indicated that, selecting stocks based on 12-month formation period and holding them for 3-months was the most successful strategy for all the momentum portfolio (zero cost portfolio) strategies.

The strategy yielded positive returns of 1.31% and 1.49% for non-overlapping and overlapping periods respectively. On the other hand, the strategy which selects stocks based on 6-month formation and holds them for 3, 6, 9 and 12 months yielded average returns of 1% per month. All the zero cost returns were statistically significant except for the strategy that selects stocks based on 3-month formation period and holds them for 3 months without skipping a week (non-overlapping holding period).

The winner portfolios yielded abnormal returns which ranged between 1.40% and 1.92%. The loser portfolios yielded abnormal returns which varied between 0.60% and 1.08% and the highest excess returns were obtained from the 3x3 strategy. The results of Jegadeesh and Titman (1993) also indicate that longer formation periods of 9 and 12 months coupled with short holding periods (3 and 6 months) were the best strategies.

A number of authors documented that individual stock momentum effect is profitable around the globe (Asness *et al.,* 2013; Leippold and Lonhre; 2012 and Fama and French, 2012; Maheshwari and Dhankar, 2017). De Groot and Swinkles (2012) argued that individual stock momentum effect is present in emerging markets. However, momentum trading strategies are not always profitable as they give negative abnormal returns when market risk is high and when markets are weakening (Daniel and Moskowitz, 2016). In addition, individual stock momentum tends to disappear when markets are not performing well (Blitz and Martin, 2011).

Ansari and Khan (2012) studied the momentum anomaly in the Indian stock market using monthly share price. Their study covered the period 1994 to 2006. The sample consisted of stocks which contained trading data for the past 12 months. Ansari and Khan (2012) adopted the methodology used in Jegadeesh and Titman (1993). However, their study created five portfolios whereas Jegadeesh and Titman (1993) had 10 portfolios.

The top 20% stocks were allocated to the winner portfolios and the bottom 20% stocks were allocated to the loser portfolios. The methodology used in ranking stocks was similar to the one employed by Blitz *et al.* (2011) and Blitz, *et al*., (2020) where individual stock momentum effect was examined using monthly residual returns other than dummy alphas. According to Ansari and Khan, the strategy that selects stocks based on a 3-month formation period and holds them for the next 3 months yielded the highest momentum profits of 12.16%. This was contrary to the study of Jegadeesh and Titman (1993) whereby the strategy that selects stock based on 12-month formation and holds them for 3 months yielded the highest momentum profit of 1.31%.

Agathee (2012) examined individual stock momentum strategies over a sample period of 9 years using stocks listed in the stock exchange of Mauritius (SEM). Contrary to the study of Ansari and Khan (2012) Agathee (2012) used monthly closing stock prices of all the shares which were listed in the stock exchange of Mauritius. Contrary to the study of Jegadeesh and Titman (1993) the stocks were divided into quintiles. Similar to the study of Ansari and Khan (2012) the top 20 percent stocks were allocated to the winner portfolio and the bottom 20 percent stocks were allocated to the loser portfolio. The study adopted the methodology used in Jegadeesh and Titman (1993) andAnsari and Khan (2012) in which a strategy of selecting stocks based on the past 3, 6, 9, and 12 months returns and holding for 3, 6, 9 and 12 months was used. This strategy gave rise to a total of 16 different strategies.

The results of the study indicated that selecting stocks based on 6-month holding formation period and holding them for 3 months generated the highest momentum profits. This is contrary to the findings of Jegadeesh and Titman (1993) andAnsari and Khan (2012) where the 12x3 and 3x3 strategies were the most successful strategies respectively. A total of 12 momentum strategies generated negative returns. The study concluded that there was no individual stock momentum effect in the stock exchange of Mauritius during the period 2001 to 2009. Agathee (2012) attributed

the ineffectiveness of momentum strategies to trade restrictions and disintegration from global markets.

In addition to the above studies, Pathirawasam and Kral (2012) tested the momentum effect in the Colombo stock exchange with the sample covering the period 1995 to 2008. The study included delisted stocks in the sample in order to eliminate the problem of survivorship bias. Similar to the study of Ansari and Khan (2012) all the stocks which had been trading for less than 12 months were excluded in the sample. The study used the procedure employed in Jegadeesh and Titman (1993), Ansari and Khan (2012) and Agathee (2012) where the strategy of selecting stock based on their past 3, 6, 9 and 12 months returns and held for 3, 6, 9 and 12 months was used. In addition, the equally weighted portfolios for the winner and loser portfolios were formulated. Contrary to the studies by Jegadeeshand Titman (1993), Ansari and Khan (2012) and Agathee (2012), the top 33% stocks were allocated to the winner portfolio and the bottom 33% stocks were allocated to the loser portfolio. A total of 16 strategies were formulated initially by imposing a time lag between the formation period and the holding period and also by imposing a one-month time lag between end of formation period and beginning of holding period.

The results obtained from the study indicated that the 9x9 strategy was the most successful with a yield of 0.603 percent per month. The results were different from the study of Jegadeesh and Titman (1993), Ansari and Khan (2012) and Agathee (2012) which indicated that the most successful strategies were 12x3, 3x3 and 6x3 respectively. When a time lag is affected, the 12x3 strategy was the most successful with a monthly yield of 0.728 percent. Pathirawasam and Kral (2012) concluded that momentum effect is present on the Colombo stock exchange. The winners' portfolio performed better than the losers' portfolio.

Zoghlami (2013) examined 56 stocks listed on the Tunisian stock market for the sample period from 1998 to 2011. The study investigated all the stocks which were listed on the Tunisian stock market. The sample selection was contrary to the studies by Ansari and Khan (2012), Agathee (2012) and Pathirawasam and Kral (2012). The study adopted the methodology used by Jegadeesh and Titman (1993). Similar to the study of Ansari and Khan (2012) and Agathee (2012) the stocks were divided into five quintiles, with the winner portfolio containing the stocks with the highest past returns and the loser portfolio containing the stocks with the lowest past returns.

The results obtained in Zoghlami (2013) indicated that the strategy that selects stocks based on a 3-month formation period and holds them for 3 months, yielded the highest average return of 2.88%. The study concluded that momentum effect was presented in the Tunisian Stock Market during the period 1998 to 2011.

Petr and Abdullah (2012) investigated the momentum strategies at the Bombay Stock Exchange and BSE 100 index for the period 2006 to 2011. They employed the methodology used in Jegadeesh and Titman (1993) and found out that momentum effect was present in the Bombay Stock Exchange and BSE 100 and also that momentum trading strategies result in excess returns. They also found out that the individual stock momentum strategy in the Bombay Stock Exchange can yield an average profit of up to 12.05% per month which is way higher than the monthly profits recorded by Jegadeesh and Titman (1993).

Habibi-ur-Rahman and Mohsin (2012) examined momentum effect in the Karachi Stock Exchange covering the period 1999 to 2007. They adopted the methodology used in Jegadeesh and Titman (1993) during portfolio construction. The stocks were grouped in deciles, whereby the top decile stocks were allocated to the winner portfolio and the bottom decile stocks were allocated to the loser portfolio. The student t-statistic was used to test if the returns were statistically significant.

The results obtained from the initial analysis indicated that the returns of the momentum strategies were only positive in a single strategy and the other 15 strategies recorded losses. The analysis was changed to long period analysis that is short term and long-term holding period analysis. The results showed minor evidence of momentum effect. Habibi-ur-Rahman and Mohsin (2012) concluded that there was very low evidence of momentum effect in the Karachi Stock Exchange and this was compatible with the previous results of Griffin et al., (2003).

Vas and Absalonsen (2014) investigated the presence of momentum effect in the Oslo Stock Exchange (OSE) covering the period 31st December 2004 to 31st December 2013. Contrary to studies by Ansari and Khan (2012), Agathee (2012), Pathirawasam and Kral (2012 and Zoghlami (2013), Vas and Absalonsen included stocks which had data for the entire observation period. Contrary to the study by Jegadeesh and Titman (1993) and Pathirawasam and Kral (2012), Vas and Absalonsen (2014) divided stocks into quintiles. Similar to the studies by Ansari and Khan (2012) Agathee (2012) and Zoghlami (2013), the top 20 percent stocks were allocated to the winner portfolio and the bottom 20 percent stocks were allocated to the loser portfolio. The study followed the formation and holding periods used by Jegadeesh and Titman (1993) andAnsari and Khan (2012). A total of 16 different strategies were investigated.

The results obtained from the study of Vasand Absalonsen (2014) indicated that the most successful zero cost strategy was the strategy that selects stocks based on the past 12-month returns and holds them for 6 months. The strategy yielded average returns of 2.41% per month. The results were different from the study of Jegadeesh and Titman (1993), Ansari and Khan (2012), Agathee (2012), Pathirawasam and Kral (2012) and Zoghlami (2013) which indicated that the most successful strategies were 12x3, 3x3, 6x3, 9x9 and 12x3 respectively. The study also found that the strategies which have longer formation periods and shorter holding periods were the most successful. Vas and Absalonsen (2014) also found out that transaction cost reduces the profits derived from the momentum strategies. Vas and Absalonsen (2014) concluded that momentum effect was present in the Oslo Stock Exchange (OSE).

Merlo and Konarzewski (2015) analysed the momentum effect on the Warsaw Stock Exchange covering the period 2000 to 2013. Contrary to the study of Zoghlami (2013), Merlo and Konarzewski (2015) strictly utilised the monthly closing prices of companies which were listed continuously on the Warsaw stock exchange in order to avoid distortion of results by illiquid companies. Similar to Zoghlami (2013) the study adopted the methodology used of Jegadeesh and Titman (1993) during portfolio construction. The stocks were grouped in deciles, whereby the top decile stocks were allocated to the winner portfolio and the bottom decile stocks were allocated to the loser portfolio. The student t-statistic was used to test if the returns were statistically significant.

The results obtained by Merlo and Konarzewski (2015) indicated that 15 out of 16 momentum strategies generated profit except for the strategy that selects stock based on 12-month formation periods and holds them for 3 months. The best momentum strategy was the one that selects stock based on 3-month formation and held them for 6 months. The strategy yielded the highest average momentum profit of 5.2%. Merlo and Konarzewski (2015) concluded that momentum effect was present at the Warsaw Stock Exchange during the period 2000 to 2013.

Khan*et al* (2016) investigated momentum strategies on The Karachi Stock Exchange (KSE). They used the data of 83 stocks listed on the KSE-100 index from 2007 to 2014. Apart from the equal weighting technique which was also used in the base study of Jegadeesh and Titman (1993) their study also investigated momentum strategies using partial rebalancing and docile techniques. The results indicated that the most successful strategy was to select stocks based on 3-month return and hold them for 3 and 9 months. The study concluded that there was low evidence of momentum effect in the Karachi Stock Exchange. These results were compatible with the previous study by Griffin*et al.,* (2003).

Zaremba (2018) investigated the momentum effect in country-level anomalies in global equity markets covering the period 1995 to 2015. A total of 78 country equity markets which included both existing and discontinued indices were included in the sample. A total of 16 robust intermarket strategies were formulated. The results indicated that the strategies that select stocks based on the performance of the past 6-12 months were the best strategies. The study concluded that momentum strategies are valuable to international investors.

Findings from earlier studies indicate that individual stock momentum effect seems to occur in different stock markets at different time periods, hence strengthening the notion that it is not a result of data mining. The different possible sources of individual stock momentum are still widely discussed, as well as the relationship with other anomalies such as size.

METHODOLOGY

The population of this study comprised of all companies listed on the Namibia Stock Exchange (NSX). A total of 41 companies were listed on the NSX during the period January 2011 to December 2019. The nine-year period is in line with previous research of Agathee (2012). The study sample comprised of companies which were consistently trading throughout the study period. The study sample was a total of 20 companies listed on the Namibian Stock Exchange. The study made use of secondary data which was obtained from Namibia Stock Exchange.The monthly closing prices were collected from the Namibia Stock Exchange.

The study adopted the procedure employed in Jegadeesh and Titman (1993) since they were the pioneers of academic work on momentum strategies. The majority of the studies (Agathee, 2012; Merlo and Konarzewski 2015; and Zoghlami, 2013) follow the methodology used by Jegadeesh and Titman (1993). The portfolio size is mainly influenced by the number of stocks, several approaches were employed by different researchers with regards to portfolio size. Jegadeesh and Titman (1993) and Liuand Fu (2011) allocated stocks into 10 decile portfolios.

This study subdivided the whole sample into 3 portfolios with 6 stocks in each portfolio, that is top 1/3 and bottom 1/3. The individual stock momentum portfolios were formed on F months lagged returns and kept for H months. Equally weighted portfolios were constructed based on the formation periods, that is the past 3-, 6-, 9- and 12-months returns (Jegadeesh and Titman, 1993). Following Pathirawasam and Kral (2012), the top 33% stocks were allocated to the winners portfolio and the bottom 33% stocks were allocated to the losers portfolio. The results of the portfolios were assessed after the holding period of 3, 6, 9 and 12 months and the zero cost returns (momentum returns) were calculated as the difference between the winner and loser portfolio. A student t-test was used to measure if the returns were statistically significant.

In line with previous research, this study followed an equal portfolio weighting approach. Jegadeesh and Titman (2001) as cited in Vas and Absalonsen (2014) indicated that momentum effect is more profitable in the first 12 months after the formation period. A total of 16 different momentum strategies that combine the different formation periods with the different holding periods were created. **Table 1** below illustrates these strategies. Non-overlapping periods, that is, without imposing a time lag between formation period and holding period were used as illustrated in **Table 2** below.

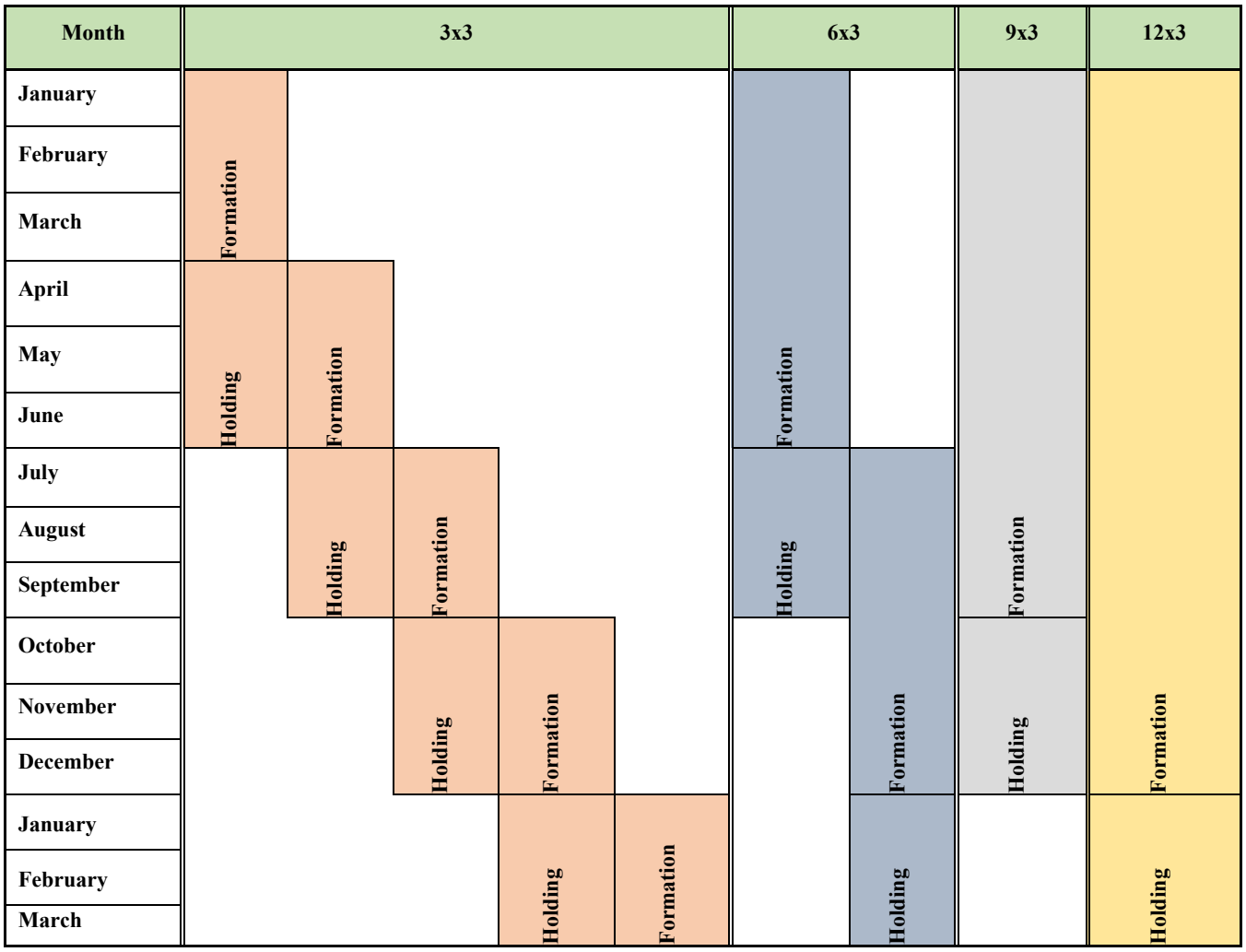
The stocks were ranked in descending order at the beginning of each month based on their Formation months' returns. The study used the strategy that examined the top 33 percent of stocks that performed well and the bottom 33 percent that underperformed. The stocks were split into three equally weighted portfolios with portfolio P1 representing stocks with the highest-ranking period returns (winner portfolio) and portfolio P3 represents stocks with the lowest ranking period returns (loser portfolio). In line with the previous study by Pathirawasam and Kral (2012), portfolios were not constructed between the top performing portfolio and the bottom performing portfolio.

Table 1. Momentum Strategies

	Formation Period (F)				
Holding Period (H)		3	6	9	12
	3	3x3	3x6	3x9	3x12
	6	6x3	6x6	6x9	6x12
	9	9x3	9x6	9x9	9x12
	12	12x3	12x6	12x9	12x12

Source: Vas and Absalonsen (2014)

Table 2. Non-Overlapping Holding Periods



Source: Researchers' own construct

The study used monthly closing stock prices to calculate monthly average returns. The monthly average returns for each momentum strategy were computed by taking the average of all the momentum portfolios made throughout the entire sample period and dividing it by the size of the holding period (H), (Vas and Absalonsen, 2014).

The returns for the winner, loser and momentum portfolios were tested for statistical significance using the student t- test statistic. A t-test was used to interpret whether the results were statistically significant. This is in line with the studies by Jegadeesh and Titman (1993) and Vas and Absalonsen (2014). Muga and Santamaria (2007) stated that the t statistic is the best way to test for statistical significance as no further adjustments need to be done on the returns. The t-limits were computed using Microsoft Excel and the degrees of freedom were n – 1.

EMPIRICAL RESULTS

This section presents the results of individual stock momentum effect in the Namibia Stock Exchange. The returns of the 16 different momentum strategies are presented in this section. Atotal of 550 portfolios were formulated (275 winner portfolios and 275 for loser portfolios) over the entire study period. **Table 3** below shows the decomposed average returns of the winner and loser portfolios as well as the momentum portfolios (winner minus loser). Table 3 indicates the monthly average returns for all the 16 strategies. The t-statistics are presented in parentheses whereby ***

indicates a significant level at 1%, ** indicates the significant level at 5% and * indicates the significant level at 10%.

In terms of the winner portfolios, Table 3 indicates that all the 16 strategies for the winner portfolios generated average positive returns in the Namibia Stock Exchange. The winner portfolio yielded average return between 3% and 11% per month. The 9x12 strategy generated the highest average monthly return of 11%. The 3x3, 3x6 and 3x9 strategies generated the lowest returns of 3%, 5% and 6% respectively. Eighty seven percent of the winner portfolios had returns which were statistically significant and only the 3x3 and 12x6 strategies generated positive returns which were not statistically significant.

Table 3. Individual Stock Momentum Effects: 2011-2019

	HOLDING (H)		3	6	9	12
FORMATION (F)	3	P1= Winner (W)	0.03	0.05	0.06	0.07
			-0.98	***(2.11)****	***(3.32)*****	***(4.16)*****
		P3 = Loser (L)	0.04	0.03	0.03	0.04
			-1.28	***-1.56***	***(1.88)****	***(2.54)****
		Zero cost portfolio	-0.01	0.02	0.03	0.03
			(-0.42)	***-0.71***	***-1.41***	***-1.31***
	6					
		P1= Winner (W)	0.07	0.08	0.08	0.09
			(2.42)*	***(2.36)****	***(3.12)*****	***(3.68)*****
		P3 = Loser (L)	-0.02	0.02	0.04	0.04
			(-0.48)	***-0.73***	***(1.92)****	***-1.5***
		Zero cost portfolio	0.09	0.06	0.04	0.05
			(2.49)*	***-1.56***	***-1.15***	***-1.41***
	9					
		P1= Winner (W)	0.09	0.1	0.1	0.11
			(1.80)*	***(2.50)****	***(4.33)*****	***(4.91)*****
		P3 = Loser (L)	0.1	0.07	0.05	0.06
			(2.21)*	***(1.75)****	***(2.10)****	***(2.77)****
		Zero cost portfolio	-0.01	0.03	0.05	0.05
			(-0.25)	***-0.89***	***-1.6***	***-1.4***
	12					
		P1= Winner (W)	0.07	0.07	0.07	0.07
			(1.99)*	***-1.56***	***(2.27)****	***(2.71)****
		P3 = Loser (L)	0.14	0.03	0.02	0.06
			(2.10)*	***-0.79***	***-0.49***	***-1.28***
		Zero cost portfolio	-0.07	0.04	0.05	0.01
			(-0.82)	***-0.65***	***-0.71***	***-0.27***

, **, * Significance at 10%, 5%, and 1%, respectively*

Source: Research Results

The loser portfolios generated positive average monthly returns and only 1 out of the 16 strategies generated negative average returns. Table 3 above indicates that the 6x3 strategy generated a negative return of -2%. The average monthly returns vary from -2% to 14%. The 12x3 strategy generated the highest monthly return of 14% which is greater than the highest average return generated by the winner portfolios. Despite generating positive average monthly returns, only 8 out of 16 strategies of the loser portfolios were statistically significant. The strategies with longer holding periods (9 and 12 months) generated higher monthly returns (except for the 12x6 and 12x9 strategies) than strategies with short holding periods (3 and 6 months).

The zero cost strategy (winner minus loser) generated positive returns except for the 3x3, 9x3 and 12x3 strategies. The 6x3 and 6x6 strategies generated the highest profits of 9% and 6% respectively. This is contrary to earlier studies by Jegadeesh and Titman (1993), Zoghlami (2013) and Vas and Absalonsen (2014), where the 12x3 strategy was the best performing momentum strategy. As illustrated in table 3 above, the worst strategies select stocks based on 12-month formation and hold them for a period of 3 months. The strategy yielded a loss of 7%. The results are similar to the study of Merlo and Konarzewski (2015) where the 12x3 strategy was among the worst performing strategies. Despite generating positive returns, the returns generated by the zero-cost strategy were not statistically significant except for the strategy that selected stock based on 6-month formation and held them for 3 months. The results are similar to the study obtained in Agathee (2012) in the Stock Exchange of Mauritius.

CONCLUSIONS

The research objective was assess the individual stock momentum effect on the Namibia Stock Exchange. The results gathered can lead to various conclusions. Although the sample size was relatively small, the results can still provide meaningful insights which can be generalised to normal practice. An in-depth examination of the individual stock momentum effect on the NSX revealed that a trading strategy based on taking a long position in the past winners and taking a short position in past losers generates abnormal returns. Although 13 out of 16 strategies generated positive returns, there is limited support for the individual stock momentum effect on e Namibia Stock Exchange.

The study reveals that individual stock momentum effect existson the Namibia Stock Exchange. Based on the findings of the study, it is recommended that investors and fund managers should incorporate momentum strategies when investing. The results proved that one can make abnormal returns by using a simple trading strategy which uses trend analysis. In addition, future studies can investigate the causes of momentum effect on the Namibian Stock Exchange. Future researchers can also investigate if momentum effect exists when taking into account transaction cost and adjusting for risk. Testing these variables will shed more light on whether the existence of momentum effects on the Namibia Stock Exchange is merely a compensation of risk or its data snooping bias.

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