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Have Investors in the Banking Sector Become More Conservative in the Long Run?

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ABSTRACT

Previous research examined contrarian investment strategies in different stock markets, but this research examines the contrarian strategy in a particular industry, the banking sector, over the period 2000–2017. The results show that in the first subperiod ending in 2009, banking stocks experienced contrarian (reversal) abnormal returns up to the three-year test period, depending on the formation period. In the second subperiod, banking winner portfolios outperformed loser portfolios; i.e., banking stocks experienced momentum abnormal returns up to the three-year test period, again depending on the formation period. The findings suggest that investors in the banking sector changed their investment behavior and became conservative after the recent financial crisis. The difference in returns cannot be attributed to risk, size or book-to-market ratio. However, winner portfolios seemed to have a higher earnings-to-market ratio, which might suggest underreaction to earnings news. The results of this paper have profound policy implications for the banking sector and stock market regulators, as well as for investors in the banking industry.

Keywords: Contrarian strategy, Momentum strategy, Overreaction, Return, Financial crisis, Earnings-to-market ratio, Book-to-market ratio.

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هل أصبح المستثمرون في القطاع المصرفي أكثر تحفظاً على المدى الطويل؟

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ملخص

درست الأدبيات السابقة استراتيجية الانعكاس الاستثمارية في العديد من أسواق الأسهم، لكن هذا البحث يختبر استراتيجية الانعكاس الاستثمارية في قطاع محدد، هو القطاع المصرفي، خلال الفترة من 2000 إلى 2017. تظهر النتائج أنه للفترة الفرعية الأولى المنتهية في 2009، شهدت أسهم البنوك عوائد انعكاسية غير عادية لمدة اختبار تصل إلى ثلاث سنوات، وذلك بناءً على فترة التكوين، بينما في الفترة الفرعية الثانية تفوقت محافظ أسهم البنوك التي حققت أعلى عوائد في أدائها على محافظ الأسهم التي حققت أقل عوائد؛ بمعنى أن أسهم البنوك شهدت عوائد زخم غير عادية لمدة تصل إلى ثلاث سنوات، أيضاً بناءً على فترة التكوين. وتدل النتائج على أن المستثمرين في القطاع المصرفي قد غيروا سلوكهم الاستثماري بحيث أصبحوا أكثر تحفظاً بعد الأزمة المالية الحديثة. والجدير بالذكر أن الاختلاف في العوائد لا يعزى إلى المخاطر، أو الحجم، أو نسبة القيمة الدفترية الى القيمة السوقية. رغم ذلك، يبدو أن المحافظ التي حققت أعلى العوائد حققت أيضاً أعلى نسبة أرباح إلى القيمة السوقية، الأمر الذي قد يدلل على التباطؤ في الاستجابة للأخبار المتعلقة بالأرباح. نتائج هذه الدراسة لها انعكاسات ومضامين عميقة على سياسات القطاع المصرفي ومنظمي السوق المالي وللمستثمرين في القطاع البنكي.

الكلمات الدالة: استراتيجية الانعكاس، استراتيجية الزخم، ردة الفعل الزائدة، العائد، الأزمة المالية، نسبة الأرباح إلى القيمة السوقية، نسبة القيمة الدفترية الى القيمة السوقية.

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I. INTRODUCTION

Investors' overreaction or underreaction to news in stock markets creates patterns in stock returns that could be profitable when trading on stocks' past returns (Jegadeesh and Titman, 1993). Interestingly, the long-term reversal strategy of buying losers and selling winners, based on their past performance over the previous two to five years, generates abnormal returns over the next two to five years (Schiereck et al., 1999). Although the profitability of contrarian strategy has been well documented, the explanation for why such a strategy works is controversial (Schiereck et al., 1999) and unresolved (Galariotis, 2014). Several explanations have been provided in the literature. One main potential explanation is the overreaction hypothesis, which suggests that (1) stock prices with extreme movements will experience a subsequent reversal and (2) the greater the initial movement of the stock price, the greater the magnitude of the reversal, which violates the weak form efficient market hypothesis (De Bondt and Thaler, 1985). Other possible explanations include risk mismeasurement, institutional factors and data mining (Schiereck et al., 1999). Furthermore, it is argued that the winner-loser hedge portfolio is unhedged and there are mismeasurement problems in the five-year buy-and-hold raw and abnormal returns, where low-priced right-skewed loser stocks drive most of the contrarian returns (Ball et al., 1995).

However, Jegadeesh and Titman (1993) showed that loser stocks stay losers and winner stocks stay winners in the short-run (momentum strategy). They found that a strategy that buys past winners and sells past losers earns significant positive abnormal returns over the next 3 to 12 months following the formation period. Furthermore, they found that although systematic risk cannot explain this positive return, a possible explanation could be that there is a delay in stock price reactions (underreaction) to company-specific news. The overreaction hypothesis of contrarian strategy and the underreaction hypothesis of momentum strategy are not contradictory, but are compatible (Forner and Marhuenda, 2003). Jegadeesh and Titman (1993) reported that part of the momentum returns reverses over the next 24 months after the 12-month holding (test) period. Hong and Stein (1999) provided a unified behavior model to explain long-term contrarian and short-term momentum strategies that is based on two not fully rational but boundedly rational investors. They assumed two types of investors: newswatchers whose behavior results in underreaction in the short run and momentum traders whose behavior results in overreaction in the long run.

Although contrarian strategies are a very popular investment style, the evidence from international emerging markets is not sufficient (Bildik and Gulay, 2007). Saleh (2007) found that contrarian strategies are at work on the Amman Stock Exchange (ASE) when he used cumulative excess returns over a long portfolio formation period of up to five years. He reported that the results were not explained by differences in size or changes in risk or illiquidity; however, the leverage effect could partially explain the winner-loser effect. Therefore, Saleh (2007) concluded that over the long run, stock prices on the ASE overreact to information, while they underreact to information over the short and medium run. This is not surprising, as it has been documented that the ASE is inefficient at the weak form (Rawashdeh and Squalli, 2006; Elbarghouthi et al., 2012; Ananzeh, 2016; Matar, 2016; Al Barghouthi and Ehsan, 2017). However, using the arithmetic average of cumulative abnormal returns, Al-Ataibi (2016) found no evidence of long-term contrarian profits over the first subperiod (1987–2005) of his study and concluded that the ASE is efficient at the weak form during this period. Nevertheless, Al-Ataibi (2016) reported that during the second subperiod

(2006-2014), the ASE witnessed contrarian profits and concluded that the ASE is inefficient during this subperiod. This finding shows that the results of contrarian profits on the ASE are mixed.

Why the banking sector on the ASE? There is evidence that the winner-loser reversal is larger in small markets in comparison with large markets that could be explained by small markets having market imperfections (Richards, 1997). In addition, markets that have different levels of development provide out-of-sample evidence and important implications for portfolio managers (Bildik and Gulay, 2007). Therefore, studying developing stock markets is interesting to further enforce and expand our knowledge about contrarian investment strategy. Furthermore, having found mixed evidence of the profitability of contrarian strategies on the ASE, this paper attempts to examine whether the banking sector experiences contrarian profits. The choice of the banking sector is motivated by the fact that the banking sector makes a large percentage of market capitalization of companies listed on the ASE, representing one of the largest sectors in Jordan's economy[1]. As of 2017, the banking sector on the ASE represents 52% of the total market capitalization of all listed companies and makes 37% of the total value traded in the market[2]. The financial sector in Jordan is robust and mature[3] and this might make the investor community think of the stock market of this sector as efficient, at least at the weak form. Therefore, it is interesting to ask whether investors in the banking sector behave rationally or overreact to news. In addition, this paper uses a study period that spans the 2008 financial crisis, which provides evidence of whether the financial crisis had an impact on investors' behavior. To the best of the authors' knowledge, this is the first study to examine the contrarian strategy on the ASE using only the banking sector, which is an important component of Jordan's economy. More specifically, this paper estimates portfolios' buy-and-hold abnormal returns to examine (1) the presence of contrarian profits in the banking sector on the ASE and (2) whether the investment behavior of investors in the banking sector has changed as a result of the financial crisis.

The rest of the paper is organized as follows: Section II is the literature review. Section III describes the sample used in the paper and the applied methodology. Section IV presents the results and provides a discussion of the results, while Section V concludes the paper.

II. Literature Review

In a seminal paper, De Bondt and Thaler (1985) supported the overreaction hypothesis and showed that previous loser portfolios outperform previous winner portfolios. They used nonoverlapping periods to calculate the cumulative excess return for each stock over the previous 36-month formation period to form portfolios and then calculated the cumulative average residual returns (CARs) of all the stocks in the portfolio over the test period that follows the formation period. They attributed the ability of previous loser portfolios to outperform previous winner portfolios to overreaction. De Bondt and Thaler (1985) reported that years two and three of the test period showed overreaction, where loser portfolios outperformed winner portfolios; i.e., the reversal effect, although the loser stocks were less risky than the winner stocks[4]. Interestingly, even at the country level, the potential risk explanation of the reversal strategy was refuted by Richards (1997). De Bondt and Thaler (1985) also found that loser portfolios earn significant January returns up to five years following portfolio formation, although the authors reported that the January effect is different from the overreaction phenomenon. Further evidence for the contrarian model was provided by Lakonishok et al. (1994) who found that glamour stocks are overpriced and value stocks are underpriced. Their model predicts that investors' expectations for the differences in future growth rates between glamour and value stocks are overestimated and related to the past growth rates of these stocks. Lakonishok et al. (1994) found evidence that is consistent with their contrarian model and reported that value strategies earn higher returns. They examined the performance of value and glamour strategies using one- and two-dimension schemes.

Rather than focusing on a long-run contrarian strategy, Chang et al. (1995) examined short-term contrarian strategies. The authors ranked stocks using monthly returns and constructed a zero-cost contrarian strategy. They examined the return on this portfolio using a test period of one month to six months after the formation period. They found that loser portfolios significantly outperform winner portfolios in the first month of the test period and the difference in returns between the loser and the winner decreases in months two through four after formation and then in months five and six, the difference becomes negative. The authors also reported that the difference in returns between losers and winners is not due to size and is not fully explained by the January effect. Other evidence and explanations were shown by Bildik and Gulay (2007) who found significant abnormal returns for the contrarian strategy that buys past losers and sells past winners. However, Bildik and Gulay (2007) attributed the contrarian returns to the higher risk of loser portfolios. They reported that loser firms are generally smaller and have higher book-to-market ratios and lower prices than winner firms, which led the authors to explain the difference in performance between loser and winner stocks due to risk and confirm that by using asset pricing models, a large part of the return reversal was explained.

Forner and Marhuenda (2003) found evidence of significant positive returns on a five-year contrarian strategy and a one-year momentum strategy in the Spanish market and concluded that these momentum and contrarian phenomena cannot be attributed to data snooping. Ball et al. (1995) raised concern that what is supposed to be a hedged portfolio, which is the loser-winner portfolio, is actually unhedged. Furthermore, they pointed out that five-year buy-and-hold raw and abnormal returns suffer from mismeasurement problems, as the loser stocks are low-priced and right-skewed and drive most of the contrarian returns. In addition, Ball et al. (1995) found that using a June end instead of a December end as a basis for portfolio formation weakens the contrarian strategy returns.

Evidence concerning the contrarian strategy on the ASE was presented by Saleh (2007), who examined the underreaction and overreaction hypotheses on the Amman Stock Exchange and found evidence of short- and medium-term momentum effects (where past losers remain losers and past winners remain winners) and a long-term reversal effect (where past losers outperform past winners). He further reported that risk, size, January effect and illiquidity are not able to explain the difference in behavior between winners and losers, but the leverage effect could partially explain this difference. Saleh (2007) concluded that the overreaction hypothesis works on the ASE over the long run, while the underreaction hypothesis works over the short and medium run. Evidence of the underreaction hypothesis was also found by Alrabadi (2012), who studied the short-term reaction of stock prices to shocks and reported that underreaction occurs on the ASE. Alrabadi (2012) found that stock prices experience significant return continuation (momentum) in the short run up to ten days after a price shock takes place and these results are not attributed to risk, liquidity or size. Al-Horani and Haddad (2011) studied the psychological factors that might affect investors' behavior on the ASE and that could explain the momentum effect. They found five psychological factors at work on the ASE: self-attribution, sensitivity to rumors, mimicking attitude, opportunistic behavior and overconfidence, while conservatism bias had mixed evidence. Ejaz and Polak (2015) documented the presence of the momentum effect in the short run in seven Middle Eastern countries, including the ASE, using a momentum strategy of buying past winners and selling past losers, based on a six-month formation period and a six-month test period. Interestingly, they reported that Jordan has the highest short-term momentum profits among the seven financial markets. They also found that momentum profits in these financial markets cannot be explained by the capital assets pricing model (CAPM). However, Gharaibeh (2016), using 23 indices from the ASE, reported no evidence of a significant momentum effect for the traditional momentum strategy and the early-stage momentum strategy. However, for the late-stage momentum strategy, he reported evidence of the momentum effect, which cannot be attributed to risk. Furthermore, in another study, Gharaibeh (2017) found the momentum effect using market indices of 10 Arab countries, including Jordan. He reported significant momentum profits for the pure (traditional) momentum strategy and the late-stage momentum strategy, while the early-stage momentum strategy showed no momentum effect. Furthermore, he showed some return reversal in the longer run using the late-stage momentum strategy.

III. Data and Methodology

Data

Monthly stock prices, cash dividends and ex-dates, yearly market capitalization, the book-to-market ratio and the earnings-to-market ratio for all 15 banks listed on the ASE were obtained from the ASE website[5] for the period 2000 to 2017 (216 months). The data covers the entire sample period from January 2000 to December 2017 for all 15 banks; i.e., there are no missing observations. Some banks changed their names during the 18-year period but were never de-listed. In addition, information on stock splits and reversals and capital changes that include capitalization of voluntary reserves, retained earnings or bonus issues (also known as scrip issues) was obtained from the Securities Depository Center[6] website. Other capital changes, such as issue price and number of shares issued, were obtained from the official website of the Jordan Securities Commission (JSC)[7]. Monthly stock returns are calculated as follows[8]:

$$R_{i,t} = \frac{D_{i,t} + (P_{i,t} - P_{i,t-1})}{P_{i,t-1}}, \qquad (1)$$

where $D_{i,t}$ is the dividends and $P_{i,t}$ is the price of stock i at time t. Monthly returns were adjusted for stock splits and other capital changes following the methods used by London Share Price Data (LSPD) issued by the London Business School (2006) as follows: For the bonus issue, the adjustment is [Cum (Old) number of shares / Ex number of shares (Old+ New)]. For the stock split or reverse split, the percentage of the increase or decrease in the number of shares is proportionate to the decrease or increase in the exercise price on the effective date compared to the exercise price before the event. For raising capital through private subscription (also known as right issue), the adjustment is [Old Shares* Cum Price (Old) + New Shares* Issue Price]/ [Ex (Old+ New) Shares* Cum Price]. Whenever an adjustment of the stock price was required, the price was adjusted retrospectively back to the beginning of the sample period; i.e., year 2000.

IV. Methodology

To examine the profitability of the contrarian investment strategy for all banks listed on the ASE, three strategies were constructed as follows (De Bondt and Thaler, 1985; Jegadeesh and Titman, 1993):

1. For the first strategy (S1), the monthly return of each stock was calculated for a 12- month formation period from January 2000 to December 2000. This process was repeated for years 2001 to 2016; i.e., 17 formation periods. At the end of December 2000, all 15 stocks were ranked according to their buy-and-hold monthly compounded returns, from the lowest to the highest and two portfolios were constructed. The first 27% of stocks with the lowest returns were called the loser portfolio (L) and the last 27% of stocks with the highest returns were called the winner portfolio (W). This process was repeated at the end of December of each year from 2001 to 2016. Then, the buy-and-hold returns were calculated for the loser and winner portfolios for (1) the next 12-month test period (T1), where the first test period was January–December 2001 and the last test period was January–December 2017; (2) the next 24-month test period (T2), where the first test period was January 2001 to December 2002 and the last test period was January 2016 to December 2017; and (3) the next 36-month test period (T3), where the first test period was January 2001 to December 2003 and the last test period was January 2015 to December 2017. Thus, we ended up with three sub-strategies (S1T1, S1T2 and S1T3).
2. For the second strategy (S2), the monthly return of each stock was calculated for a 24-month formation period from January 2000 to December 2001. This process was repeated for the years 2002 to 2016; i.e., 16 overlapping formation periods. At the end of December 2001, all 15 stocks were ranked according to their buy-and-hold monthly compounded returns, from the lowest to the highest and two portfolios were constructed. The first 27% of stocks with the lowest returns were called the loser portfolio (L) and the last 27% stocks with the highest returns were called the winner portfolio (W). This process was repeated at the end of December of each year from 2002 to 2016. Then, the buy-and-hold returns were calculated for the loser and winner portfolios for (1) the next 12-month test period (T1), where the first test period was January–December 2002 and the last test period was January–December 2017; (2) the next 24-month test period (T2), where the first test period was January 2002 to December 2003 and the last test period was January 2016 to December 2017; and (3) the next 36-month test period (T3), where the first test period was January 2002 to December 2004 and the last test period was January 2015 to December 2017. Thus, we ended up with three sub-strategies (S2T1, S2T2 and S2T3).
3. For the third strategy (S3), the monthly return of each stock was calculated for a 36-month formation period from January 2000 to December 2002. This process was repeated for years 2003 to 2016; i.e., 15 overlapping formation periods. At the end of December 2002, all 15 stocks were ranked according to their buy-and-hold monthly compounded returns, from the lowest to the highest and three portfolios were constructed. The first 27% of stocks with the lowest returns were called the loser portfolio (L) and the last 27% of stocks with the highest returns were called the winner portfolio (W). This process was repeated at the end of December of each year from 2003 to 2016. Then, the buy-and-hold returns were calculated for the loser and winner portfolios for (1) the next 12-month test period (T1), where the first test period was January–December 2003 and the last test period was January–December 2017; (2) the next 24-month test period (T2), where the first test period was January 2003 to December 2004 and the

last test period was January 2016 to December 2017; and (3) the next 36-month test period (T3), where the first test period was January 2003 to December 2005 and the last test period was January 2015 to December 2017. Thus, we ended up with three sub-strategies (S3T1, S3T2 and S3T3).

4. On each formation date, a hedge portfolio was constructed by going long on (buying) the loser portfolio (L) and going short on (selling) the winner portfolio (W) and buy-and-hold returns were reported for all the nine sub-strategies (hedge portfolios); S1T1, S1T2, S1T3, S2T1, S2T2, S2T3, S3T1, S3T2 and S3T3. The buy-and-hold (BHR) monthly compounded return of individual stock was estimated as follows (Jegadeesh and Titman, 1993)[9]:

$$BHR_{i,t} = \left(\prod_{t=0}^{T}\left(1 + R_{i,t}\right) - 1\right), \quad (2)$$

where $R_{i,t}$ is the monthly stock return of stock *i* in month *t* calculated as in equation (1). *T* is the number of months.

5. The return of the hedge portfolio (LMW) was calculated as an equally weighted return and a value weighted return. For the equally weighted return, the return on the hedge portfolio was calculated as the difference between the equally weighted return[10] of the loser portfolio and the equally weighted return of the winner portfolio. Whereas for the value weighted return, the return on the hedge portfolio was calculated as the difference between the value-weighted return[11] of the loser portfolio and the value-weighted return of the winner portfolio. Finally, to test the statistical significance of the average return on the portfolio (loser or winner) and the zero cost (hedge portfolio) for any year, a t-test was used with Newey-West (1987) standard errors to correct for autocorrelation that results from using overlapping holding periods, following Jegadeesh and Titman (1993).

This paper uses the raw return instead of market-adjusted returns, because subtracting market returns from each stock return produces results that could be interpreted similarly to raw returns, as explained by De Bondt and Thaler (1985). Furthermore, De Bondt and Thaler (1985) found that the results are not affected by the choice of the method for estimating the return residuals, whether it is based on market-adjusted excess residuals, the market model or the Sharpe-Lintner CAPM. Overlapping formation and test periods were used for 24- and 36-month test periods to increase the test power, as argued by Jegadeesh and Titman (1993). This strategy means that in any year, the investor holds a series of portfolios (Jegadeesh and Titman, 1993). Lakonishok et al. (1994)[12] used equally weighted returns and an annual buy-and-hold strategy for the subsequent years after formation and used raw returns and size-adjusted returns.

V. Results and Discussion

If the overreaction hypothesis works, then returns on winner portfolios during the test period should be less than zero and returns on loser portfolios should be greater than zero, which means that the difference between the returns on the winner and loser portfolios (hedge portfolios) should be significantly greater than zero (De Bondt and Thaler, 1985). The results of testing this hypothesis are reported in Tables 1 to 6. Table 1 presents the results of the one-year formation period with one-, two- and three-year test periods. De Bondt and Thaler (1985) argued that using a three-year (36 months) test period is a long enough period from a statistical and economic perspective and they supported the appropriateness of the three-year test period with Benjamin Graham's argument that undervaluation takes, on average, 1.5 to 2.5 years to be corrected[13].

Table 1. A one-year formation period

PORTFOLIO	1-YEAR	2-YEAR	3-YEAR
PANEL A: EQUALLY WEIGHTED			
L (27%)	**0.24**	**0.77**	**1.34**
	(0.1589)	(0.1645)	(0.1663)
W (27%)	**0.25**	**0.55**	**1.11**
	(0.0388)	(0.1058)	(0.1309)
H (L-W)	***-0.01***	***0.22***	***0.23***
	(0.9094)	(0.3478)	(0.4474)
PANEL B: VALUE WEIGHTED			
L (27%)	**0.18**	**0.61**	**1.05**
	(0.1078)	(0.1489)	(0.1678)
W (27%)	**0.23**	**0.50**	**1.08**
	(0.0593)	(0.1225)	(0.1538)
H (L-W)	***-0.05***	***0.11***	***-0.03***
	(0.1944)	(0.3698)	(0.8100)

Table 1 presents the average buy-and-hold returns of the loser (L), winner (W) and hedge H (L-W) portfolios for a one-year formation period and three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted and value weighted portfolios. The sample period is 2000–2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

Table 1 shows that none of the hedge portfolios earned statistically significant returns for the equally weighted (Panel A) and value weighted (Panel B) portfolios. Thus, no reversal effect was found for the one-year formation period, regardless of the length of the test (holding) period. This finding is consistent with De Bondt and Thaler (1985), who found no reversal effect for a one-year formation period.

Then, the study period was split into two subperiods using 2009[14] as the cut-off point. Omri et al. (2019) and Syriopoulos and Bakos (2019) considered 2008 as the year during which the financial crisis became profound. The contrarian strategy returns (hedge portfolio L-W) and the returns on the loser (L) and winner (W) portfolios are reported in Table 2; for equally weighted (Panel A) and value weighted (Panel B). In the first subperiod, hedge portfolios earned positive buy-and-hold returns, except the value-weighted one-year test period hedge portfolio, but the return is statistically significant only for the two-year holding (test) period, for equally weighted and value-weighted portfolios. In contrast, in the second subperiod (which represents the years after 2009), the hedge portfolios have statistically significant returns in all holding periods (one year, two years and three years), for the equally weighted portfolios and for the one-year test period for the value weighted portfolios.

Table 2. A one-year formation period and two subperiods

PORTFOLIO	1-YEAR	2-YEAR	3-YEAR	1-YEAR	2-YEAR	3-YEAR
PANEL A: EQUALLY WEIGHTED						
	First Subperiod			**Second Subperiod**		
L (27%	**0.40** (0.1268)	**1.44** (0.0731)	**2.72** (0.0506)	**0.06** (0.0197)	**0.10** (0.1324)	**0.13** (0.1790)
W (27%	**0.34** (0.0834)	**0.89** (0.1051)	**2.07** (0.0784)	**0.14** (0.0014)	**0.21** (0.0033)	**0.27** (0.0469)
H (L-W)	**0.06** (0.5861)	**0.55** (0.0636)	**0.65** (0.1185)	**-0.08** (0.0113)	**-0.10** (0.0715)	**-0.13** (0.0580)
PANEL B: VALUE WEIGHTED						
L (27%	**0.29** (0.0871)	**1.12** (0.0678)	**2.13** (0.0576)	**0.06** (0.0615)	**0.10** (0.1674)	**0.11** (0.2442)
W (27%	**0.33** (0.1080)	**0.82** (0.1140)	**2.09** (0.0859)	**0.12** (0.0011)	**0.17** (0.0065)	**0.20** (0.1155)
H (L-W)	**-0.04** (0.5774)	**0.30** (0.0380)	**0.04** (0.8837)	**-0.06** (0.0742)	**-0.07** (0.3699)	**-0.09** (0.2582)

Table 2 presents the average buy-and-hold return of the loser (L), winner (W) and hedge H (L-W) portfolios for a one-year formation period and three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted and value weighted portfolios and for two subperiods, the First Subperiod 2000–2009 and the Second Subperiod 2010–2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

However, the return is negative, suggesting the momentum effect (Jegadeesh and Titman, 1993) rather than the reversal effect. The momentum effect could be interpreted as investors underreacting to news (Jegadeesh and Titman, 1993).

The results of forming portfolios using a two-year formation period and calculating the buy-and-hold returns over one-, two- and three-year test periods are reported in Table 3. Similar to the results based on the one-year formation period, the contrarian strategy buy-and-hold returns are not statistically significant.

Table 3. Two-year formation period

PORTFOLIO	1-YEAR	2-YEAR	3-YEAR
PANEL A: EQUALLY WEIGHTED			
L (27%	**0.29** (0.1539)	**0.79** (0.1862)	**1.26** (0.1852)
W (27%	**0.22** (0.0780)	**0.47** (0.1072)	**0.87** (0.1376)
H (L-W)	**0.07** (0.4024)	**0.32** (0.3304)	**0.40** (0.3404)
PANEL B: VALUE WEIGHTED			
L (27%	**0.23** (0.1664)	**0.60** (0.2023)	**1.04** (0.2036)
W (27%	**0.19** (0.0947)	**0.42** (0.1376)	**0.87** (0.1563)
H (L-W)	**0.04** (0.5128)	**0.18** (0.4154)	**0.17** (0.5120)

Table 3 presents the average buy-and-hold return of the loser (L), winner (W) and hedge H (L-W) portfolios for a two-year formation period and three different test periods, one-year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted and value weighted portfolios. The sample period is 2000–2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

However, when the sample period was split into two subperiods, the results, which are presented in Table 4, show statistically significant contrarian returns for the two- and three-year test periods in the first subperiod. In the second subperiod, the results show the momentum effect for the two- and three-year test periods and only for the value-weighted hedge portfolios. For the UK market, Hon and Tonks (2003) found statistically significant momentum returns for short- and medium-term holding periods up to 24 months for only a subperiod of their study and concluded that this result confirmed that the momentum effect is not a general phenomenon of the stock market. This observation seems to apply to the ASE as well.

Table 4. Two-year formation period and two subperiods

PORTFOLIO	**1-YEAR**	**2-YEAR**	**3-YEAR**	**1-YEAR**	**2-YEAR**	**3-YEAR**
PANEL A: EQUALLY WEIGHTED						
	First Subperiod			**Second Subperiod**		
L (27%	**0.49** (0.1435)	**1.56** (0.1069)	**2.74** (0.0812)	**0.09** (0.0140)	**0.11** (0.1459)	**0.15** (0.1125)
W (27%	**0.32** (0.1423)	**0.75** (0.1651)	**1.63** (0.1349)	**0.12** (0.0043)	**0.22** (0.0020)	**0.29** (0.0650)
H (L-W)	**0.17** (0.1682)	**0.81** (0.0794)	**1.12** (0.0340)	**-0.03** (0.5590)	**-0.10** (0.1444)	**-0.14** (0.1612)
PANEL B: VALUE WEIGHTED						
L (27%	**0.41** (0.1272)	**1.21** (0.1101)	**2.32** (0.0895)	**0.06** (0.0515)	**0.06** (0.1893)	**0.08** (0.2033)
W (27%	**0.29** (0.1485)	**0.70** (0.1894)	**1.68** (0.1448)	**0.09** (0.0008)	**0.17** (0.0005)	**0.26** (0.0412)
H (L-W)	**0.11** (0.1361)	**0.51** (0.0677)	**0.63** (0.0130)	**-0.04** (0.2656)	**-0.11** (0.0429)	**-0.18** (0.0518)

Table 4 presents the average buy-and-hold return of the loser (L), winner (W) and hedge H (L-W) portfolios for a two-year formation period and three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for the equally weighted and value weighted portfolios and for two subperiods, the First Subperiod 2000-2009 and the Second Subperiod 2010-2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

Table 5 shows the results of forming contrarian portfolios based on a three-year formation period. It is clear that there is no evidence of statistically significant buy-and-hold returns on the hedge portfolios. However, when the sample period was split into two subperiods, the results, which are reported in Table 6, show that contrarian returns are statistically significant in the first subperiod and for all three test periods. Interestingly, De Bondt and Thaler (1985) found that the difference between loser and winner portfolios is stronger for the three-year formation period and the two-year test period compared with one-year and two-year formation periods. However, the second subperiod indicates a momentum effect for two test periods (the one- and two-year test periods) and only for the value weighted hedge portfolios. Saleh (2007) found evidence of the momentum effect on the ASE when short to medium formation periods are used, while reversal occurs when the long-term formation period is used. He reported that when the return is calculated over three months, one year and two years or three years, losers continue to be losers while when using returns estimated over four years and five years, losers outperform winners six months after the portfolio formation date and up to five years. Saleh's (2007) sample period covered 1980-2002.

Table 5. Three-year formation period

PORTFOLIO	1-YEAR	2-YEAR	3-YEAR
PANEL A: EQUALLY WEIGHTED			
L (27%	**0.34** (0.1803)	**0.84** (0.1897)	**1.12** (0.2015)
W (27%	**0.21** (0.1308)	**0.35** (0.1815)	**0.60** (0.1769)
H (L-W)	**0.13** (0.3031)	**0.49** (0.2366)	**0.52** (0.2833)
PANEL B: VALUE WEIGHTED			
L (27%	**0.32** (0.2164)	**0.66** (0.2244)	**0.94** (0.2333)
W (27%	**0.20** (0.1424)	**0.35** (0.1744)	**0.56** (0.1672)
H (L-W)	**0.12** (0.4019)	**0.31** (0.3474)	**0.38** (0.3846)

Table 5 presents the average buy-and-hold return of the loser (L), winner (W) and hedge H (L-W) portfolios for a three-year formation period and three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted and value weighted portfolios. The sample period is 2000-2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

Table 6. Three-year formation period and two subperiods

PORTFOLIO	1-YEAR	2-YEAR	3-YEAR	1-YEAR	2-YEAR	3-YEAR
PANEL A: EQUALLY WEIGHTED						
	First Subperiod			**Second Subperiod**		
L (27%	**0.64** (0.1613)	**1.73** (0.1536)	**2.64** (0.1311)	**0.08** (0.0430)	**0.17** (0.0040)	**0.18** (0.0395)
W (27%	**0.32** (0.2564)	**0.59** (0.2923)	**1.15** (0.2349)	**0.11** (0.0017)	**0.18** (0.0661)	**0.26** (0.1535)
H (L-W)	**0.33** (0.0888)	**1.15** (0.0910)	**1.49** (0.0620)	**-0.04** (0.4190)	**-0.01** (0.9049)	**-0.08** (0.4351)

PANEL B: VALUE WEIGHTED						
L (27%	**0.65** (0.1459)	**1.45** (0.1494)	**2.33** (0.1332	**0.03** (0.1514)	**0.07** (0.0296)	**0.07** (0.0164)
W (27%	**0.31** (0.2704)	**0.57** (0.3144)	**1.06** (0.2244)	**0.11** (0.0005)	**0.19** (0.0058)	**0.24** (0.1241)
H (L-W)	**0.34** (0.0725)	**0.88** (0.0608)	**1.26** (0.0648)	**-0.07** (0.0227)	**-0.12** (0.0733)	**-0.17** (0.2092)

Table 6 presents the average buy-and-hold return of the loser (L), winner (W) and hedge H (L-W) portfolios for a three-year formation period and three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted and value weighted portfolios and for two subperiods, the First Subperiod 2000–2009 and the Second Subperiod 2010–2017. P values are in parentheses, with Newey-West (1987) standard errors to correct for autocorrelation.

In contrast, our results show that when the formation period is one year, the loser minus winner portfolio earns a statistically significant positive return (reversal effect) only when the holding (test) period is two years. When the formation period is two years, there is evidence of the reversal effect for the two- and three-year test periods and when the formation period is three years, the reversal returns are statistically significant for all test periods. These findings apply only to the first subperiod that includes the 2008 financial crisis. After the financial crisis, the findings show no reversal effect, but show a momentum effect and in particular, for the value-weighted hedge portfolio. These findings are partially consistent with Saleh's (2007) results. Specifically, the longer the formation period, the greater the evidence of the reversal effect. However, the reversal (contrarian) effect in this study occurred in the first subperiod (2000-2009), while for the second subperiod (2009-2017), the momentum effect dominated the banking sector.

A very important and interesting observation emerges, which is that the reversal effect seems to disappear after 2009 and is replaced by the momentum effect. This raises the following question: Have investors in the ASE become more conservative, by underreacting to news[15] after the financial crisis? Barberis et al. (1998) argued that conservatism is consistent with the underreaction phenomenon.

However, "If there were a persistent tendency for the portfolios to differ on dimensions that may proxy for 'risk', then, again, we cannot be sure whether the empirical results support market efficiency or market overreaction" (De Bondt and Thaler, 1985:796). Richards (1997) used standard deviations of winner and loser portfolios as a measure of risk in segmented markets. As our loser and winner portfolios are not diversified, because they were constructed from the banking sector only, Table 7 reports the standard deviations of the loser and winner portfolios, along with the F-test of equality of variances, to shed light on the possible drivers of the reversal and momentum returns that are identified on the ASE. For all three formation periods, the standard deviations of the loser portfolios are higher than those of the winner portfolios in the first subperiod except for two value-weighted test periods, the one- and three-year test periods related to the one-year formation period, although no F-values are statistically significant.

Table 7. Standard deviations of loser and winner portfolios

Panel (A)						
	First Subperiod			*Second Subperiod*		
EW	**ONE-ONE**	**ONE-TWO**	**ONE-THREE**	**ONE-ONE**	**ONE-TWO**	**ONE-THREE**
Standard deviation L	0.6804	2.0978	3.5496	0.1162	0.1775	0.2149
Standard deviation W	0.5514	1.2727	2.5927	0.1345	0.2135	0.3229
F-value (Equality of Variances)	**0.5656**	**0.2107**	**0.4639**	**0.7091**	**0.6384**	**0.3046**
VW						
Standard deviation L	0.4558	1.482	2.6197	0.1528	0.2055	0.2063
Standard deviation W	0.5273	1.1263	2.6945	0.1117	0.1918	0.3223
F-value (Equality of Variances)	**0.69**	**0.4861**	**0.9473**	**0.4279**	**0.8603**	**0.2621**
Panel (B)						
	First Subperiod			*Second Subperiod*		
EW	**TWO-ONE**	**TWO-TWO**	**TWO-THREE**	**TWO-ONE**	**TWO-TWO**	**TWO-THREE**
Standard deviation L	0.8054	2.2041	3.3812	0.1235	0.184	0.1848
Standard deviation W	0.6225	1.1917	2.4852	0.1347	0.1818	0.3601
F-value (Equality of Variances)	**0.5128**	**0.16**	**0.5155**	**0.8245**	**0.9749**	**0.0993**
VW						
Standard deviation L	0.7382	1.6546	3.0703	0.1282	0.1334	0.1469
Standard deviation W	0.5688	1.1289	2.6759	0.1003	0.109	0.2824
F-value (Equality of Variances)	**0.5078**	**0.3743**	**0.7702**	**0.5336**	**0.6073**	**0.1060**
Panel (C)						
	First Subperiod			**Second Subperiod**		
EW	**THREE-ONE**	**THREE-TWO**	**THREE-THREE**	**THREE-ONE**	**THREE-TWO**	**THREE-THREE**
Standard deviation L	0.9123	2.5013	3.7265	0.1005	0.1514	0.18
Standard deviation W	0.6388	1.2236	2.3702	0.1117	0.2379	0.3532
F-value (Equality of Variances)	**0.4070**	**0.1426**	**0.4022**	**0.7872**	**0.2563**	**0.0962**
VW						
Standard deviation L	0.8919	2.0545	3.3678	0.1166	0.14138	0.1091
Standard deviation W	0.6179	1.2398	2.0985	0.094	0.1692	0.3207
F-value (Equality of Variances)	**0.3934**	**0.2918**	**0.3818**	**0.5843**	**0.6476**	**0.0109**

Table 7 presents the standard deviations of the buy-and-hold return of the loser (standard deviation L) and winner (standard deviation W) portfolios and the p values for the F-test of the equality of the variances of the two portfolios, for three different test periods, one year (I-YEAR), two years (2-YEAR) and three years (3-YEAR), for equally weighted (EW) and value weighted (VW) portfolios and for two subperiods, the First Subperiod 2000-2009 and the Second Subperiod 2010-2017. Panel (A) shows the one-year formation period, Panel (B) shows the two-year formation period and Panel (C) shows the three-year formation period.

For the second subperiod, the standard deviations of the winner portfolios are higher than those of the loser portfolios when the buy-and-hold returns are equally weighted, except for one portfolio, which is the portfolio with the two-year formation period and the two-year test period. In the case of the value weighted portfolios and for all formation periods, the standard deviations of the loser portfolios for the one- and two-year test periods are higher than their corresponding winner portfolios except for the portfolio with the three-year formation period and the two-year test period. It is worth noting that, for the three-year test period, regardless of the formation period, winner portfolios have higher standard deviations than loser portfolios. However, all F-values except for three sets of portfolios are not statistically significant. Thus, it could be argued that the reversal return in the first period and the momentum return in the second period cannot be explained by differences in risk. This finding is in line with Lakonishok et al. (1994), who examined the standard deviations of glamour and value investment strategies and found no support for a fundamental risk story behind the superior performance of value stocks.

Reversal and momentum returns cannot be explained by either size or the book-to-market ratio, as shown in Table 8 (Panels A and B). The results are consistent with those of Lakonishok et al. (1994), who showed that the difference in return between value and glamour stocks cannot be fully explained by size. Similarly, Chan et al. (1996) found that momentum returns cannot be explained by size and the book-to-market ratio. Even for the short-term contrarian strategy, Chang et al. (1995) found that size and systematic risk cannot account for contrarian profits.

In contrast to the findings of size and the book-to-market ratio, Panel C of Table 8 shows evidence that winner portfolios have higher earnings-to-market ratio than loser portfolios and the difference is statistically significant. This might indicate supportive evidence of Chan et al.'s (1996: 1682) "underreaction to earnings-related information" hypothesis of momentum returns.

In sum, the results suggested that the stock market of the banking sector is inefficient at the weak form, supporting previous results regarding the inefficiency of the ASE. The results also showed that the investment behavior of investors in the banking sector seems to have changed following the recent financial crisis, suggesting that they became more conservative, in particular in their reaction to earnings-related news.

Table 8. Firm characteristics of loser stocks and winner stocks

	One	***Two***	***Three***
	Panel A: Size		
L	2,044,982,723	2,515,458,578	2,851,258,265
W	2,382,517,678	1,807,720,460	2,346,671,229
Difference in Mean (L-W)	**-337,534,955 (0.77)**	**707,738,118 (0.40)**	**504,587,036 (0.61)**
	Panel B: BM		
L	0.87	0.86	0.83
W	0.77	0.69	0.66
Difference in Mean (L-W)	**0.10 (0.43)**	**0.18 (0.15)**	**0.17 (0.19)**

	Panel C: EM		
L	0.03	0.05	0.05
W	0.08	0.09	0.08
Difference in Mean (L-W)	**-0.05 (0.02)**	**-0.04 (0.02)**	**-0.03 (0.08)**

Table 8 presents the following: Panel A: The average total market capitalization (size) of the loser portfolio (L) and the winner portfolio (W) and the difference in the average market capitalizations between the loser and winner portfolios. Panel B: The average book-to-market ratio (BM) of the loser portfolio (L) and the winner portfolio (W) and the difference in the average book-to-market ratio between the loser and winner portfolios. Panel C: The average earnings-to-market ratio (EM) of the loser portfolio (L) and the winner portfolio (W) and the difference in the average earnings-to-market ratio between the loser and winner portfolios. The sample period is 2000–2017. P values for the differences in the means are in parentheses.

However, to better understand the investment behavior of investors in the banking sector, further research must be carried out to examine whether this phenomenon of underreaction continues in the future.

VI. Conclusion

This paper attempts to better understand the behavior of investors in emerging markets by examining the performance of contrarian (reversal) investment strategies in the banking sector on the ASE. The choice of the banking sector is based on the fact that it accounts for 52% of the total market capitalization of listed firms on the ASE and 37% of the total traded value. This makes it an interesting case to see whether the banks that are considered among the largest and most robust companies in the stock market show reversal and/or momentum returns. The findings are very interesting: Over the entire sample period, no abnormal returns were found. However, when the study period was split into two subperiods with 2009 as the cut-off point, the first period witnessed reversal returns, where past loser portfolios outperformed past winner portfolios, while the second subperiod experienced momentum returns, where past winner portfolios outperformed past loser portfolios. The significant contrarian and momentum returns are not explained by risk, size or the book-to-market ratio. In contrast, the earnings-to-market ratio is statistically significantly higher for winner portfolios, supporting Chan et al.'s (1996) "underreaction to earnings-related information" hypothesis of momentum returns. Equally important, the findings of this paper suggest that investors in the banking sector changed their investment behavior after the 2008 financial crisis and have become more conservative. These findings have implications for stock exchange markets and banking sector regulators in particular, as well as for security and exchange commissions (SECs) in general.

Notes

1. https://oxfordbusinessgroup.com/overview/still-pillar-led-banking-financial-services-sector-remains-engine-growth-kingdom
2. Source is ASE
3. https://oxfordbusinessgroup.com/overview/still-pillar-led-banking-financial-services-sector-remains-engine-growth-kingdom
4. De Bondt and Thaler (1985) also examined other durations; five-, two- and one-year periods for formation and test periods.
5. www.ase.com.jo

6. www.sdc.com.jo
7. www.jsc.gov.jo
8. This paper uses the simple return as in many studies, such as Campbell et al. (2001).
9. To shed light on the methods used to calculate returns, see the following: De Bondt and Thaler (1985) calculated the average CARs for each month for the winner (top) and loser (bottom) portfolios over all test periods. Jegadeesh and Titman (1993) reported the average monthly returns and compounded excess returns. Hon and Tonks (2003) used continuously compounded returns and Saleh (2007) used compounding as well.
10. Lakonishok et al. (1994) used equally weighted buy-and-hold returns for the portfolios.
11. Saleh (2007) used value-weighted and equally weighted returns on the portfolios.
12. They argued that annual buy-and-hold periods are more representative of investors' actual returns than monthly buy-and-hold periods. They reported compounded five-year returns as well.
13. Nevertheless, De Bondt and Thaler (1985) also used other durations: one, two and five years for the formation and test periods.
14. As a result of the financial crisis, the U.S. economy worsened "in late 2008 and early 2009" (https://economix.blogs.nytimes.com/2013/10/29/the-beginning-of-the-end-of-the-financial-crisis/).
15. Although attributing contrarian (reversal) returns to overaction and momentum returns to underreaction is too simplistic (Jegadeesh and Titman, 1993).

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