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FEASIBLE MOMENTUM STRATEGIES IN THE MOROCCAN STOCK MARKET

Abstract:

The major goal of this paper is to find out if there is a momentum impact at the company level in Morocco. In our study, we used stock prices from 59 Moroccan companies traded on the Casablanca Stock Exchange (CSE) from 2008 to 2017. Moreover, Jegadeesh and Timan's (1993) Methodology was utilized to create momentum portfolios. In reality, this research provides solid evidence of the momentum impact in Moroccan firm portfolios, proving that a six-momentum approach with a twelve-month holding duration generated a high return of 7,3412 percent per month on average. likewise, our study shows that the momentum method is still profitable and statistically significant when applied to a sub-period sample. Meanwhile, we showed that the CAPM model and the Fama French three-factor model may accurately describe momentum earnings in the Moroccan market.

Keywords:

Casablanca Stock Exchange, Momentum Effect, CAPM, Fama–French Three-Factor Model.

JEL Classification: G02, G10, G11

Introduction

Generally speaking, the assumption that capital markets are efficient in an informational sense is one of the most contentious questions in the study of financial economics. According to Fama (1970), the efficient markets hypothesis (EMH) is disputed by trading methods based on the idea that historical data is rich in information about the future direction of equity prices. In line with this, many scholars discovered trends in stock prices during the 1980s that challenged the hypothesis of efficient markets.

Jegadeesh and Titman noticed in 1993 that going long in enterprises that have done well in the past and going short in stocks that have performed poorly in the past yield good returns during 3–12-month holding periods. In the literature, the sustainability of stock returns is alluded to as the Momentum Effect. As an outcome, this strategy has been shown to "beat the market" by about 1% per month. Since the only information needed to generate momentum portfolios is available to the public historical stock prices, the excess returns of momentum trading methods contradict Fama's (1970) Efficient Market Hypothesis.

Following the introduction of this strategy, several studies were done to validate or debunk abnormal returns, and they attempted to explain this momentum anomaly using various theories, including risk-based and behavior-based theories. Furthermore, market efficiency theorists have proposed that momentum revenues are remuneration for taking risks, whereas behavioral theorists argue that investor cognitive biases create momentum earnings. However, no deal has been obtained as of yet. As a result, despite all of the research, the momentum anomaly remains unsolved.

Our fundamental motive for producing this paper is the fact that investors appear to be able to generate positive and significant returns by simply executing a trading strategy that appears to violate the efficient markets hypothesis (EMH). The majority of the studies on the predominance of the momentum effect have been conducted in developed markets rather than emerging economies. There were just a few references to the momentum effect and momentum trading strategies in the Moroccan stock market, suggesting that the Moroccan stock market is even more overlooked. However, the experiments conducted in this regard are largely aimed at determining the informational effectiveness of the Casablanca stock market (M, Lekhal & A, El Oubani,2020). Additionally, in Morocco, anomalies in the stock market, notably the momentum impact, have not been thoroughly studied. These qualities make it intriguing for investigation, and the absence of academic studies on the direction of momentum in the Moroccan Market motivated the choice to undertake this study.

This paper also attempts to duplicate Jegadeesh and Titman's (1993) work and investigate the presence of momentum in the Moroccan stock market. Furthermore, because a risk-based approach may be able to explain the observed momentum return patterns in the Moroccan Stock Market, the Fama-French (1993) three-factor asset pricing model is included in this analysis. Furthermore, by regressing momentum portfolio returns on the Fama-French three factors, the returns of momentum portfolios will be risk-adjusted, and the results of time-series regressions may provide a more informative assessment of whether the returns generated by momentum trading strategies are simply compensation for taking risks or are the result of potential market inadequacies. Thus, this is how the current paper will be structured:

The first section focuses entirely on shedding light on past important literature on momentum trading. The second section describes the data source. the third section discusses the empirical approach used in this study in terms of portfolio construction. The final section of this study presents the important empirical findings for profitabilities of the Momentum and risk-

adjusted returns, as well as a robustness check and a general conclusion on what has been mentioned throughout this work.

1. Review of literature

Generally speaking, Capital market efficiency and the forecasting of future stock values are two of finance's most thought-provoking and passionately debated topics. There are a lot of disputes about whether or not markets are efficient; this topic became more well-known after E. Fama published «Efficient Capital Markets: A Review of Theory and Empirical Work" in 1970, which was the first publication on the Efficient Market Hypothesis. In line with this, researchers in various markets throughout the world have discovered distinct patterns in average stock returns that contradict the EHM theory. Furthermore, these patterns have been dubbed "Anomalies," with one empirical anomaly being the asset price reversal or continuation. Debondt and Thaler (1985) provided demonstrations of a price reversal in short and long-term timeframes, which evolved into the well-known profitable strategy contrarian, which provides abnormal returns. As a result, Bondt and Thaler concluded that stocks that were losers over the preceding 3 to 5 years create larger returns than past winners over the same period. In keeping with this, one of those financial markets' peculiarities is the momentum effect. Long-term reversals, contrarian investing techniques, and momentum, on the other hand, relate to the prediction of return patterns based on the simplest type of data available to all market participants: past stock prices.

The majority of research on the momentum anomaly is based on a groundbreaking study by Jegadeesh and Titman (1993), who reported ground-breaking results on this subject, have found that between 1965 and 1989, previous winner stocks outperformed past loser stocks by around 1% per year on average across a three- to twelve-month time horizon. Furthermore, the momentum method yields a monthly return of 1.31 to 1.49 percent. This happens when the formation and holding periods are separated by one week. Except for the 3-months/3-months method without skipping a week. Besides, Jegadeesh and Titman (1993) found that all the zero-cost portfolios have significantly positive returns. In their research also, the method based on the preceding 12-month' stock returns and three months of holding periods was the most successful. The 6-month formation strategies, independent of the holding period, provide around 1% monthly returns.

Chan, Jegadeesh, and Lakonishok, J (1996) employed predominantly listed stocks on the NYSE, NASDAQ, and AMEX, but only used the most representative 6-month/6-month method which is the most repetitive strategy. Over the first two quarters, they claimed a zero-cost Momentum return of 0.088 and the return was not less than 0.154 over the first four quarters. But, in the second and third years following the date of formation, these returns were -0.06 and 0.012, respectively. Therefore, JT's (1993) interpretation of the dispute between practitioners and proponents of the contrarian approach is consistent with these findings. Following their study, many other researchers have documented comparable outcomes using Momentum strategies across a variety of datasets and periods. Saying so, profits are also found in 12 European nations, according to Rouwenhorst (1998). Moreover, Conrad and Kaul (1998) published data that back to Jegadeesh and Titman's prior studies (1993). Likewise, Rouwenhorst (1998) discovered an identical return pattern in emerging economies, however, the average yield on these markets is lower than in the previous study in the United States and Europe. In addition, he discovers that, contrary to previous research, the loser portfolio generates positive returns. Additionally, according to Nagel (2001), the Fama and French models cannot characterize the momentum effect in the UK market. Griffin, Ji, and Martin (2003) investigated the momentum effect in 40 countries worldwide in a similar vein. the exception of Asia, they find positive and significant momentum profits on all continents.

Moreover, Patro and Wu (2004) investigated momentum techniques and found statistically significant earnings using daily, weekly, and monthly data from 18 industrialized countries. Kloster-Jensen (2006), on the other hand, suggested that there is no momentum effect in the Norwegian market, which contradicts the findings of the other theory. In line with this, Gutierrez and Kelley (2008) find a significant reversal in the first two weeks after portfolio building using a comparable strategy, but for a weekly sample of the US stock market. This influence disappears quickly after portfolio development in the third week, while momentum effects increase from week 3 during week 52. In regards to Arab countries, it was recently determined that, while the momentum strategy does not work in Jordanian company market returns, the large-scale momentum method is profitable and statistically significant. Gharaibeh Ghara (2015).

Briefly, the literature offers a lot of evidence that momentum strategies are profitable in most stock markets and among other asset classes. Even though many scientists have attempted to explain it, the explanation for its profitability remains unknown. Furthermore, it has been argued that other publications try to explain stock momentum profitability using various macroeconomic variables or market states (Chordia and Shivakumar,2002. Likewise, Cooper, Gutierrez, and Hameed,2004), and some contend that the better profitability created by momentum strategies is due to an increase in risk, (Fama and French, 1992, 1993, and 1996) and (Conrad and Kaul 1998). Several writers have offered behavioral models based on the premise that investors are not completely rational and are subject to various cognitive biases, Kent, Hirshleifer, and Subrahmanyam (1998). Furthermore, other scholars claim that momentum profits may develop as a result of investor irrationality, psychological flaws in information processing, as well as specialized sample choices, and data mining, Cooper, Guitierrez, and Hameed (2004). In response to criticism of data mining, Jegadeesh and Titman (2001) looked into sub-period returns and found that momentum strategies are lucrative in all sub-periods. These results also prove that the findings of Jegadeesh and Titman's (1993) investigation were not coincidental.

Similarly, Jegadeesh and Titman (2001) regressed monthly average returns of 6-month/6-month strategy momentum portfolios and discovered that after risk adjustment by the Fama-French three components model, alpha for the zero-cost portfolio is positive and statistically significant. Along these lines, the findings demonstrate that momentum returns are resilient and persist after risk adjustments, implying that the US market is not completely efficient. However, proponents of the EMH hypothesis believe that, while anomalies are frequently associated with market inefficiency, they might equally be the consequence of pricing model misspecification.

Besides, stock market anomalies, particularly the momentum effect, have not been systematically investigated in Morocco. The research conducted in this regard mostly includes experiments aimed at determining the Casablanca stock market's informational efficiency, for instance: this can be noticed when M. Lekhal and A. El Oubani (2020) used linear, nonlinear, and momentum profitability tests to analyze market efficiency from January 1992 to September 2019. According to linear and nonlinear testing, the efficiency degree is time-varying, as previously stated. Furthermore, they learn from a momentum test that profit opportunities appear from time to time and then vanish once they are exploited. Surprisingly, both market efficiency and specific market conditions influence momentum earnings. As a result, investors can profit from inefficiencies and particular market situations by employing trading tactics such as momentum. Sifouh, N., Oubal, K. (2018) investigate this phenomenon in the Moroccan financial market using a sample of 52 equities listed from 2002 to 2015 in which the findings support the presence of the momentum effect in the near term.

Similarly, EJAZ and POLAk, P. (2014) investigated the presence of the short-term momentum impact and its explanation using seven stock markets from six Middle Eastern nations using a risk-based model (CAPM). As a result, all of the stock markets in the sample had excellent momentum returns, and the j6k6 price momentum investment approach created statistically significant profits. Morocco, on the other hand, is yielding 9% returns that are statistically significant. Short-term momentum earnings of the j6k6 price momentum investing strategy cannot be explained by risk-based models. Thus, this conclusion implies that the risk is not the cause of momentum earnings. In turn, Kistemaker, T (2018) compared momentum returns across nations and examines the effects of various macroeconomic factors on these returns, where the financial system, legal system, and religious system of a country are the three major variables that are examined. The momentum profits are calculated for every January and July between 1995 and 2017. Thus, In Morocco, momentum effects are significant in four strategies with a one-month lag, but not in those with no one-month lag.

2. Data

The purpose of this research is to evaluate whether or not the Casablanca stock market has a momentum impact. We used samples from 59 companies with 75 stocks listed on the Casablanca Stock Exchange in this investigation (CSE). The data for this study were collected from 2008 to 2017, covering a ten-year timeframe. Furthermore, the sample period is consistent with past research. According to Jegadeesh and Titman (2001), eight-year periods, from 1990 to 1998, were examined to support their findings.

Historical monthly stock closing prices, market capitalization, and book-to-market values were gathered using the Decypha database. Besides, we used the monthly market returns, MASI (Moroccan All Shares Index) gathered from the Decypha data set to estimate the momentum returns against the Fama-French 3-factor model and the CAPM model, whilst the 13-week T-bill risk-free rate was downloaded from the Morocco Central Bank Library.

3. Methodology

the Methodology that is employed in this article is divided into two main parts where: The first part refers to price momentum strategy construction, and the second part refers to CAPM and Fama French three-factor model estimation.

3.1 Momentum Sort

the methodology is based on Jegadeesh and Titman's "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency" (1993).

According to Jegadeesh & Titman (2001), the momentum effect appears to provide positive and significant returns in the first 12 months; however, Jegadeesh (1990) discovered evidence of shorter-term return reversals utilizing techniques based on past 4-week outcomes. In addition, the most common strategy in the momentum literature is to employ a formation period of 3, 6, 9, or 12 months, followed by a holding period of 3, 6, 9, or 12 months.

Therefore, in our research, we will build portfolios by selecting stocks based on their performance over the previous 3, 6, 9, and 12 months, denoted by the letter "J," and holding them for 3, 6, 9, and 12 months, respectively, denoted by the letter "K." As a consequence, 16 unique J-month/K-month approach combinations can be investigated in this study. So, based on that month's return, all stocks in month " t" are ranked from highest to lowest, with the stocks with the highest return dubbed " winner" and the stocks with the lowest return dubbed " loser," Further, we utilized the Decile strategy to rank the stocks in each portfolio. Furthermore, the Winner portfolio, which includes the 33.1/3 percent of firms with the highest past J-month returns, and the Loser portfolio, which includes the 33.1/3 percent of firms with the lowest past J- month returns, are created every month. In the same thoughts,

Stocks are divided into ten decile portfolios by Jegadeesh & Titman (1993) and K. Rouwenhorst (1998).

To increase the power of statistical tests, the studied strategies include portfolios with overlapping holding periods (Partial Rebalancing), where each portfolio rebalances at the start of each month, meaning that in any given month "t," various J-month/K-month strategies hold series of portfolios that were selected in the current month and the previous K – 1 month. In line with this, by permitting a one-month interval between the end of the sorting period and the start of the holding period, the current study follows Balvers and Wu's (2006) strategy. Furthermore, the primary idea is to create equally weighted zero-cost portfolios each month, so that prior winners are bought and losers are sold. We should theoretically be able to fund the winners by selling the losers' stocks. likewise, a WML (winner-minus-loser) portfolio is what this is called. Because it is a zero-cost investment strategy, the WML portfolio is referred to as profit. I use the continuously compounded method, which is the most common, to analyze stock returns (Campbell et al. 1997).

$$R_{i,t} = \ln\left(\frac{P_{i,t}}{P_{i,t-1}}\right)$$

Where $P_{i,t}$ is the closing price for the company i on the calendar day t, and $P_{i,t-1}$ is the closing price for the company i on the prior calendar date t. Then, for the observed period of J- month, cumulative returns are calculated as follows:

$$CR_{i,t}(J) = \Sigma_{t=1}^{J} R_{i,t}$$

The stocks are then sorted by accumulated return, with the 30 percent best and worst performances going into the winner (W) and loser (L) portfolios, respectively. As a result, the return on an equally weighted stock portfolio is calculated as follows:

$$CR_{P,t} =)\frac{1}{N}\Sigma_{t=1}^{N} CR_{i,t}(J)$$

Furthermore, the return of the zero-cost momentum strategy portfolio is indicated as $CR_{M,t}(J)$, which can be determined by subtracting the return of the Loser portfolio denoted $CR_{L,t}(J)$ from the return of the Winner portfolio denoted $CR_{W,t}(J)$:

$$CR_{M,t}(J) = CR_{W,t}(J) - CR_{L,t}(J)$$

The monthly return averages of all momentum strategies are then computed using the average of all zero-cost equally weighted portfolios built throughout the studied period and divide it by the duration of the holding period:

$$MR = \frac{1}{K}\Sigma_{t=1}^{T} CR_{M,t}(J)$$

3.2 Risk Identification

In this paper, I used two primary models to see if a risk-based model can justify the observed momentum return patterns in the Moroccan stock market as a reward for taking on greater risks where: Sharpe and Lintner & Sharpe (1965; 1964) used a single- factor CAPM, and the Fama-French three-factor model, which is used by Fama and French researchers (1993). The CAPM model is the first risk adjustment model used:

$$R_{it} - R_{Rt} = a_i + b_i(R_{Mt} - R_{Ft}) + ei_t$$

The Fama and French three-factor model is the second risk adjustment model used:

$$R_{it} - R_{Rt} = a_i + b_i(R_{Mt} - R_{Ft}) + s_i SMB_t + h_i HML_t + ei_t$$

Where R_{it} refers to the return of asset i at time t. Besides, R_{Ft} are the risk-free returns and $R_{Mt} - R_{Ft}$ allude to the excess market return. Moreover, SMB_t deal with the size factor and HML_t is the value factor. The coefficients b_i , s_i , h_i , in the same line of thoughts, represent the asset's sensitivity to each of the factors where a_i is the intercept and ei_t is the error term at time t.

4. Empirical Results
4.1 Profitability of the Momentum strategy

Concerning the First Table, it displays the decomposed average returns for the Winners, Losers, and zero-cost portfolios with overlapping holding periods, by Jegadeesh and Titman's (1993) base research. The 33.1/3 percent of portfolios with the highest J-month returns are in the short-term winner equal-weighted portfolio (SW), whereas the 33.1/3 percent of portfolios with the lowest J-month returns are in the short-term loser equal-weighted portfolio (SL). Pure contrarian strategies (SW-SL) portfolios are held for K= 3, 6, 9, or 12 months.

Table 1: Profitability of Momentum strategies

J	Portfolio	K=3	K=6	K=9	K=12
3	SW	1,2009%*	3,3975%***	4,6351%***	6,5506%***
		1.8874	3.5126	3.6904	4.3001
	SL	0,2677%	-0,1183%	0,1951%	0,7054%
		0.3600	-0.1082	0.1343	0.4112
	SW-SL	0,9332%*	3,5158%***	4,4400%***	5,8453%***
		1.9065	5.2813	4.9310	5.6985
6	SW	1,9228%***	4,2967%***	6,3354%***	8,0073%***
		3.0477	4.4702	5.0259	5.2235
	SL	-0,1344%	-0,1433%	0,0886%	0,6661%
		-0.1903	-0.1246	0.0612	0.3774
	SW-SL	2,0571%***	4,44%***	6,2468%***	7,3412%***
		4.2849	5.9712	6.5130	6.6735
9	SW	2,3403%***	4,709%***	6,4175%***	7,2597%***
		3.9783	5.2090	5.2859	4.8953
	SL	0,0748%	0,5341%	1,1711%	1,8649%
		0.1078	0.5011	0.8476	1.0349
	SW-SL	2,1723%***	4,1749%***	5,2465%***	5,3948%***
		3.9185	5.4799	5.8518	4.7288
12	SW	2,7209%***	5,5989%***	7,1393%***	8,5131%***
		4.6304	5.9221	5.6384	5.4119
	SL	0,5905%	1,0011%	1,2171%	1,5575%
		0.8448	0.8847	0.8240	0.8285
	SW-SL	2,1304%***	4,5977%***	5,9222%***	6,9556%***

	3.9225	5.5384	5.9986	5.8472

Table 1 reveals substantial evidence of momentum strategy at the company level in Morocco. This data shows significant and positive momentum SW-SL profits for all J and K months. As a result, the most successful zero-cost strategy selects equities based on their 6-month returns and holds the portfolio for a year, yielding a 7.34 percent return.

Therefore, the long side of the zero-cost portfolios is relatively successful. However, these techniques' average monthly returns range from 0.93 percent to 7.34 percent. To emphasize this point, the following example may be useful; In Jegadeesh and Titman's (1993) analysis, returns for momentum portfolios built immediately after the formation phase range from 0.58 percent to 1.31 percent (excluding the most extreme and insignificant 3-month/3-month case). In addition, monthly variations in winners and losers range from 1.4 percent to 1.92 percent for winners and 0.6 percent to 1.08 percent for losers.

Furthermore, we can show that increasing the formation period for a particular holding duration delivers outstanding results if we look at the statistically significant data from the winning portfolios. During our test period, purchasing the winning portfolio appeared to be profitable. Given this, and at first appearance, our findings imply that investing in the Casablanca Stock Exchange's winner portfolios can yield abnormal profits, with average monthly returns ranging from 1.20 percent to 8.51 percent.

Besides, when we examine the loser portfolios more closely, we can see that all of our results are statistically insignificant; we've discovered that increasing the formation duration while keeping the holding period constant produces higher returns. Loser's investments have average monthly returns ranging from -0.12 percent to 1.86 percent. Therefore, the results of the momentum portfolio sort show that the CSE has a medium to long-term momentum effect throughout the sample period.

4.2 Sub-period analysis

As a robustness check, the performance of the momentum approaches was divided into two sub-periods, which will be studied as follows. The first sub-period runs from January 2008 to December 2011, while the second runs from January 2012 to December 2017.

Moreover, the sample is generally divided in half by these sub-periods. As a result, the results are only provided for methods with a 6-month formation duration (J =6 months f and K=3, 6, 9, and 12 months) to save space. Table 2 displays the momentum findings and their t-statistic for the first sub-period in (Panel A) and the second sub-period in (Panel B).

Table 2: Profitability of Momentum Strategy Based on sub-periods

J	Portfolio	K=3	K=6	K=9	K=12
Panel A: Sub-period 1 (January 2008 to December 2011)					
6	SW	1,81399%*	4,28746%**	7,41005%***	10,23313%***
		1.7457	2.6440	4.1860	5.6344
	SL	-0,5572%	-0,7177%	-0,8088%	0,0347%
		-0.4344	-0.3669	-0.4160	5.6344
	SW-SL	2,37121%***	5,0052%***	8,21885%***	10,1984%***
		3.2370	4.3342	6.9373	7.6567
Panel B: Sub-period 2 (January 2012 to December 2017)					
6	SW	2,15113%***	4,53443%***	6,08672%***	7,34115%***
		2.6650	3.8008	3.4683	3.2615

SL	0,2726%	0,9426%	1,9724%	3,5581%
	0.3189	0.6719	0.9955	1.4207
SW-SL	1,87856%***	3,59182%***	4,11432%***	3,78307%**
	2.8210	3.5254	2.8694	2.4029

Table 2 illustrates that both sub-period momentum strategies and full-period momentum strategies create high profits and significant excess returns for all holding periods. Excess returns also increase monotonically as the holding period months increase, similar to the entire sample results. The 6; 12 portfolios, which was the top-performing portfolio throughout the full sample, had the largest excess monthly return of 10, 1984 percent for the sub-period (Refer to Table 1).

The results of the second sub-sample are less consistent than those of the total sample and the first sub-sample when considering variation due to holding periods. As a result, increasing from k=3 to k=9 leads to an increase in excess return, whereas moving from k=9 to k=12 results in a drop in excess return. Furthermore, the excess returns in the second sub-sample are significantly lower than in the first, with the 6;9 portfolios achieving the highest excess average monthly return of 4,11432 percent. Furthermore, on the cross-section of CSE shares, there is a strong medium to long-term momentum apparent across the chosen sample period. The results of the momentum over the sub-samples and throughout the entire sample period yield some intriguing findings.

4.3 Risk Adjustments Analysis

So far, we have seen that an investment plan based on stock returns continuing to climb appears to pay off handsomely. This section, on the other hand, investigates whether the risk-based approach can explain the momentum returns observed in this study as a reward for taking risks or as a result of irrationalities after risk adjustment by the CAPM and Fama-French three factors model.

Throughout this essay, I looked into the strategy that is based on a 6-month ranking period and a 12- month investment period. Because it is the most profitable, this strategy may adequately represent all of the other strategies. As a result; I took the strategy's average monthly returns and regressed them on the Fama-French three-factor model and the CAPM model.

The calculated regression coefficients with corresponding t-statistics and adjusted R-squared values, as well as the annualized regression alphas, are included in Table (3) for the winner, loser, and winner-loser portfolios for the 6- formation period with 12- a month holding term.

Table 3: Risk-Adjusted Momentum Profits

Portfolio	CAPM Model			Three-factor model				
	α	bRm-Rf	Adj R2	α	bRm-Rf	bSMB	bHML	Adj R2
SW	0.113936	1.932117	0,89%	0.137832	2.468302	0.444031	0.566239	1,08%
	2.283046	1.385879						
SL	0.012978	0.993090	-0,60%	0.006729	0.853139	0.084802	-0.169845	-2,33%
	0.227895	0.624247						
SW-SL	0.079497	1.278443	0,57%	0.109698	1.955875	0.393526	0.733802	5,59%
	2.185689	1.258224						

The Alpha number further represents all of the returns from the momentum portfolio that can be explained by market risk variables. Beta, on the other hand, measures undiversified risk

and reflects the risk associated with portfolios. As a result, Beta does not quantify total risk in a momentum portfolio, but simply the degree of systematic risk.

As a result, the CAPM model's Moroccan market results show that the time series regressions' alphas are statistically significant at the 5% level for Winner 0.113936 (t-stat 2.283046) and zero-cost portfolio, but insignificant for Loser 0.012978 (t-stat 0.227895), indicating that the momentum strategy's profitability survives the risk-adjustment process because the alpha of the momentum zero-cost portfolios (SW-SL) remains significant at 0.079497 where (T-stat 2.185689). Furthermore, market risk coefficients for Winner 1.932117 (t-stat 1.385879); whereas, 0.993090 loser (t-stat 0.624247) and the zero-cost portfolio 1.278443 (t-stat 1.258224); those are statistically insignificant and hence cannot explain the momentum returns.

As seen in the tables above, the CAPM can explain 0. 89 percent of the return variation in the winner portfolios, but not - 0. 60 percent of the return variation in the loser portfolios. The CAPM thus explains 0.57 percent of the return variation in zero-cost portfolios. Likewise, Asness (2013) investigated the momentum earnings for U.S. individual stocks and global individual equities, as well as low R-square results for zero-cost portfolios. In line with this, the R-square values for U.S. stocks and worldwide stocks are 5.9% and 6.4 percent, respectively.

Furthermore, the risk-adjusted momentum result from the Three-factor model follows a similar pattern. The zero-cost portfolio yields a significant alpha of 0.109698 (t-stat 2.944403) at the 1% level, which is somewhat greater than the alpha generated by the CAPM model.
The momentum strategy's winner portfolio has a significant alpha of 0.137832 (t-stat 2. 629841), whereas the loser portfolio has an insignificant alpha of 0.006729 (t-stat 0.111450).

Furthermore, at the 1% level, Winner's market risk coefficients are statistically significant. On the other hand, the beta values of a market risk factor for a loser portfolio are insignificant; the Winners-minus-Losers portfolios are significant. As a result, they can explain the return of momentum. In line with this, when looking at the factor loadings, it is clear that the Winners and Losers portfolios in the size factor SMB and the value factor HML factor have no statistical significance. In zero-cost portfolios, on the other hand, HML is significant at the 1% level, whereas SMB is insignificant. As a result, this risk factor SMB has no discernible effect on momentum profits. contrariwise, the value factor HML has a significant impact on momentum earnings.
Hence, in conclusion, Table 3 clearly illustrates that Moroccan market returns have an amazing momentum profit, which both the one-factor CAPM and the Fama-French three-factor model can explain. Momentum portfolio results, on the other hand, demonstrate a correlation with risk variables. Furthermore, the three-factor model outperforms the CAPM model by a small margin.

Conclusion

 In this article, we have investigated whether the Moroccan stock market has a momentum impact and whether a firm-level momentum approach delivers abnormally large gains. Fundamentally, the research conducted in this study is motivated by a scarcity of relevant studies on the predictability of returns at the Moroccan stock level.
In a nutshell, the findings of this study provide strong evidence that a momentum effect exists in the Moroccan stock market, which tends to yield positive, statistically significant abnormal returns. Over a 12-month holding period, the 6- momentum approach, for example, delivers an average return of 7, 3412 percent. the results of this study show that the returns of the firm-

level momentum strategy can be explained by the CAPM and the Fama-French three-factor model, which is not consistent with Nagel (2001).

Moreover, the three-factor approach has been demonstrated to be ineffective in explaining the effect of the relaunch in the UK market, according to Nagel (2001). In a similar vein, we observe that in the Moroccan market, the winner's portfolio tends to be quite profitable.

Therefore, despite the wide range of research, there are still some gaps that additional future research can fill. In summary, current research can be seen as encouraging scientists not only in Morocco but around the world to study this anomalous phenomenon. We also encourage you to further investigate the relationship between Morocco's market performance and strong profits. This indicates that the momentum effect at the company level will need to be investigated further to figure out what is driving it.

References:

Asness, C. S., Moskowitz, T. J., & Pedersen, L. H. (2013). Value and momentum everywhere. *The Journal of Finance*, *68*(3), 929-985.

Balvers, R., &Wu, Y. (2006). Momentum and mean reversion across national equity markets. Journal of Empirical Finance, 13, 24–48.

Bondt, W. F., & Thaler, R. (1985). Does the stock market overreact?. The Journal of finance, 40(3), 793-805.

Conrad, J., & Kaul, G. (1998). An anatomy of trading strategies. Review of Financial Studies, 11, 489-519.

Cooper, M., Guitierrez, R. C., & Hameed, A. (2004). Market States and Momentum. Journal of Finance ,59, 1345-1366.

Chan, K.C.L., Jegadeesh, N., & Lakonishok, J. (1996) Momentum strategies. Journal of Finance ,51, 1681–1713.

Chordia, T., & Shivakumar, L. (2002). Momentum, business cycle and time-varying expected returns. Journal of Finance, 57, 985–1019.

Ejaz, A., & Polak, P. (2014). short -term momentum effect: a case of middle east stock markets Business: Theory and Practice,16(1),104–112

Fama, E.F. (1970). Efficient capital markets: a review of theory and empirical work. Journal of Finance ,25, 383–417.

Fama, E.F., & French, K.R. (1992). The Cross-Section of Expected Stock Returns. Journal of Finance, 47 (2), 427–465.

Fama, E.F., & French, K.R. (1993). Common risk factors in the returns on stocks and bonds. Journal of Financial Economics, 33 (1), 3–56.

Fama, E.F., & French, K.R. (1996). Multifactor explanations of asset pricing anomalies. Journal of Finance, 51, 55–84.

Gharaibeh, O. K. (2015). Interaction of size and momentum effects in Jordan firms: 2005-2014. International Review of Management and Business Research, 4(1), 121–136.

Griffin, J. M., Ji, X., & Martin, J. S. (2003). Momentum investing and business cycle risk: Evidence from pole to pole. The Journal of Finance, 58(6), 2515-2547.

Gutierrez, Jr. R. C., & Kelley, E. K. (2008). The long-lasting momentum in weekly returns. Journal of Finance, 63(1),415–447.

Hong, H., & Stein, J. (1999). A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets. Journal of Finance ,54, 2143–2184.

Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. Journal of Finance, 48, 65–91.

Jegadeesh, N., & Titman, S. (2001). Profitability of momentum strategies: An evaluation of alternative explanations. Journal of Finance ,56, 699–720.

Kloster-jensen, C. (2006). Markedseffisiensteorien og momentum på Oslo børs. Norwegian School of Economics and Business Administration.

Kent, D., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor Psychology and Security Market under- and Overreactions. Journal of Finance, 52, 1839-1885.

Kistemaker, T.(2018). Do country characteristics influence the momentum effect? A recent study on the momentum effect around the globe. Radboud university, Nijmegen School of Management, Master Thesis

Lekhal, M., & El oubani, A. (2020). Réexamen de l'efficience du marché financier marocain à la lumière de l'Hypothèse des Marchés adaptatifs. Revue Du contrôle, De La Comptabilité Et De l'audit, 4(1), 202-2018.

Nagel, S. (2001). Is it overreaction? The performance of value and momentum strategies at long horizons. The Performance of Value and Momentum Strategies at Long Horizons. EFA.

Patro, D. K., & Wu, Y. (2004). Predictability of short-horizon returns in international equity markets. Journal of empirical finance, 11(4), 553-584.

Rouwenhorst, K.G. (1998). International momentum strategies. The Journal of Finance, 53, 267–284.
Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. The review of economics and statistics, 47,13-37.

Rouwenhorst. (1999). Local Return Factors and Turnover in Emerging Stock Markets. Journal of Finance, 54, 1439-1464.

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. Journal of Finance, 19, 425‑442.

Sifouh, N., & Oubal, K. (2018). Irrégularités sur le marché financier marocain : cas de l'effet Momentum. Revue Marocaine de recherche en management et marketing, 18,119-135.