

Momentum in the Tunisian stocks returns: identification of some risk factors

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Abstract

This paper first examines to what extent the most puzzling phenomenon of stock returns momentum, may also concern emerging and little markets, such the Tunisian one, which accounts slightly less than 100 listed securities. The results indicate a pronounced and even stronger momentum effect that allows an average monthly return of about 2.43% (compared to 1% documented by Jegadeesh and Titman in the American stocks' markets).

Secondly, the study examines the sensitivity of the documented momentum' profits to some risk factors using as benchmark the CAPM and the Fama and French three-factor model. The results are revealing. Since, and contrary to the rebellious developed markets' momentums profits, the market and the size factors seem accounting for the Tunisian momentum profits.

JEL classification: G12, G14

Keywords: momentum effect, emerging stocks' markets, CAPM model, Fama and French three-factor model

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1 Introduction

The momentum effect in stocks' returns is an intriguing phenomenon that was identified in many financial markets. Formally, this regularity was first documented by Jegadeesh and Titman [8] (hereafter JT), who confirm the continuation' tendency of the stock returns in the American financial markets on the 16 medium temporal horizons considered. Such observation has certainly some serious implications on the market efficiency hypothesis, especially on its axiom of the hazardous evolution of stock returns. Some academic researchers were content to trivialize this empirical statement presented by JT [8] and to refer it to some snoop data [3]. Also Schwert [17] asserts that the momentum effect is no more than a temporary phenomena that should disappears just after it becomes visible to the investors' community.

That's why some researchers tried to change the period study [9, 10], and other researchers tried to change the space and explored the momentum effect in other financial markets (Europeans financial markets [13, 15, 16], Asian financial markets [1, 5], ...). The results of all of these researches are interestingly consensual and surprising. The momentum effect is identified wherever and whenever it's explored. Thus and despite its popularity in the investors' community and its visibility in the academic' community there is no evidence that the momentum effect tends to disappear.

On the other hand, many other researchers assert that the momentum strategy' profitability escapes to the CAPM model and to Fama and French three-factor model [2, 3, 4, 9, 10, 11, 12]. That is the momentum strategy is not associated to some particular excessive risk market, neither to some size or HML factors to justify its significant profitability. In contrary the strategy offers some insurance against the risk market since it presents negative and significant loading coefficients overall the risk factors presented by the models and the risk adjusted momentum abnormal returns had increased rather than decreased. With this second statement, the momentum becomes more intriguing and reinforces its

ambiguity. Since the associated strategies' profits seem defying any risk-based explanation.

Despite that the momentum effect is identified and confirmed in many financial markets, nevertheless, the researchers were often interested with occidental, large and developed financial markets to explore this phenomenon and we note a little momentum exploring works in emerging financial market, especially those relative to the MENA region.

In this paper, we try justly to explore the momentum effect in the Tunisian stocks' market. The exploration that we lead covers two particular dimensions. In the first dimension, we try to check the existence of the momentum effect in the Tunisian stocks' returns and to precise its temporal horizon terms. The second dimension of the research is to study the cross sectional risk differences among the winners, losers and momentum portfolios. Especially we examine their respective risk adjusted returns using as benchmark the market and to the three-factor models.

The results report a significant momentum effect in Tunisian stocks' returns overall the 16 temporal horizons explored. Moreover the Tunisian momentum effects seem stronger than the American stocks' markets (since the Tunisian momentum effects permit an average monthly return of about 2.43% compared to 1% documented by JT [8]).

Nevertheless the most revealing results and contrary to the developed stocks markets' momentum, the market and the size factors seem accounting for the Tunisian momentum effects' abnormal returns.

The rest of the paper is organised as follow: the second section documents the momentum effect in the Tunisian stocks' market, the third section explores the cross sectional factor risk differences associated with the momentum' returns using as benchmark the market and the Fama and French three-factors models. Section four concludes the paper.

2 Momentum effect in the Tunisian stocks' market

The momentum in stock returns was revealed initially and indirectly by Grinblatt and Titman [6, 7] who document that the mutual funds and some ranking firms tend to buy the ex-winner stocks and to sell the ex-losers stocks. According to this statement, the mutual funds seem adopting the momentum strategy which underlines some continuation in the stock returns tendency.

Formally, JT [8] were the first researchers that document directly the momentum in stock returns on NYSE and AMEX. Precisely they had distinguished 16 different horizons temporal. In each temporal horizon they had constructed a momentum strategy which consists in buying the last winners stocks and selling the past losers stocks. Then they had examined the profitability of each momentum strategy constructed. From the 16 documented strategies' significant profitability, these two researchers assert that effectively the ex-winners stocks continue to do better than the ex-losers stocks and document so the presence of momentum effect in stocks' returns during the period beginning from January 1965 to December 1989.

In this research, and using the same JT [8]' methodology, we document momentum in Tunisian stocks' returns. That is we had constructed and examined the 16 momentum strategies' profitability.

2.1 Momentum trading strategies' construction

The strategies we consider select stocks based on their returns over the past 1, 2, 3 and 4 quarters. That is we rank the stocks in a descending order based on their average past returns realised respectively over the past 3, 6, 9 and 12 months. In each ranking period considered we regroup stocks into deciles. The first decile regroups the stocks having the higher past returns (past winners stocks) and the tenth decile regroups the stocks having the weaker past returns (past losers stocks). Each strategy buys the past winners stocks and sells the past losers stocks,

holding this position during some next holding period. We also consider holding period that vary from 1 to 4 quarters. Then we get the 16 strategies J months/K months. For each ranking period of J months, we associate four different K months' holding periods.

Explicitly, for each momentum strategy J/K explored we proceed as follows: at the beginning of month t , we compute the average monthly return realised by each stock during the past J months, then we rank these average monthly stocks' returns in a descending order and regroup them into equally weighted ten deciles. The first portfolio regroups the ex-winners stocks and the tenth portfolio regroups the ex-losers stocks. The strategy consists in buying the first stocks' portfolio and selling the tenth stocks' portfolio. Then we examine the average monthly returns provided by this strategy during the following K months. That is we compute the difference between the average monthly returns of the ex-winners stocks portfolio and the average monthly returns of the ex-losers stocks portfolio that was realised during the holding period.

If this difference is positive and significant then the profitability of the considered momentum strategy J/K is proved. Such results assert that the ex-winners stocks during the J past months continue to outperform the ex-losers stocks during the following K months, and so they give strong evidence for the presence of the phenomenon of momentum in stock returns.

2.2 Momentum trading' strategies returns

This paragraph documents the returns of the momentum strategies implemented as described above over the 1998 to 2004 period using the Tunisian stocks' daily returns. All stocks with available daily returns data since the J months preceding the portfolio formation date are included in the sample.

Table 1 reports the average return of the different buy and sell portfolios, as well as the zero-cost winners minus losers' portfolios for the 16 strategies J months/ K months. Table 1 gives the winner portfolios average return, the loser

portfolios average return as well as the zero-cost winner minus loser portfolios average return. The portfolios are formed based on the J months lagged returns and held for the following K months. The values of K and J for the different strategies are indicated in the first column and row, respectively. The stocks are ranked in descending order on the basis of J months lagged returns and are divided into 10 equally weighted portfolios. The lowest past returns decile is the sell portfolio and the highest past returns decile is the buy portfolio. The momentum portfolio is the portfolio which is long in the buy portfolio (winners stocks) and short in the sell portfolio (losers stocks). The sample period is January 1998 to December 2004.

The returns of the all zero-cost momentum portfolios which are long in ex-winners stocks and short in ex-losers stocks are positive. Moreover all of these returns are significant. The most successful zero-cost momentum strategy selects stocks based on their returns over the previous 9 months and then holds the portfolio for the next 3 months.

The average monthly return provided by this strategy is about 3.1%. Thus, and similarly to all the previous researches' findings, we document a momentum effect in the Tunisian stocks' returns. Moreover the momentum effect detected in the Tunisian stocks' returns seems stronger than the momentum effects documented in the developed stocks' markets, since the underlying 16 strategies provide an average monthly return of 2.43% compared to 1% per month documented in the American and European stocks' markets [8, 9, 15, 16].

We notice indeed that if we kept the holding period fixed, the zero-cost momentum portfolio return increases each time that the ranking period rises. This may be explained by the fact that over some longer ranking period, the distinction between winner stocks and losers stocks becomes stronger and more representative. That is the winner stocks that did well in the long past ranking period have more chance to continue to do the same in the future than the winner stocks which did well over a short past ranking period. In fact the good or the

worst performance during past short ranking period may be accidental and not informative of the real stock potential. So the stocks' returns present lesser probability to continue in the same tendency.

Table 1: Trading' strategies returns

K	J	3	6	9	12
3	<i>Buy portfolio return</i>	0.031 (3.87)	0.028 (4.65)	0.033 (4.96)	0.025 (3.73)
	<i>Sell portfolio return</i>	0.009 (0.25)	-0.001 (0.25)	0.002 (0.34)	-0.008 (0.44)
	<i>Zero-cost momentum portfolio return</i>	0.022 (3.54)	0.027 (4.65)	0.031 (4.48)	0.033 (3.04)
6	<i>Buy portfolio return</i>	0.023 (4.48)	0.028 (5.59)	0.030 (5.29)	0.023 (3.98)
	<i>Sell portfolio return</i>	0.002 (0.36)	0.002 (0.53)	0.001 (0.80)	-0.008 (0.59)
	<i>Zero-cost momentum portfolio return</i>	0.021 (4.52)	0.026 (5.47)	0.029 (4.98)	0.031 (3.43)
9	<i>Buy portfolio return</i>	0.023 (5.15)	0.023 (5.34)	0.027 (4.89)	0.032 (3.70)
	<i>Sell portfolio return</i>	0.003 (0.89)	0.001 (0.34)	0.003 (1.31)	-0.005 (1.38)
	<i>Zero-cost momentum portfolio return</i>	0.020 (4.93)	0.022 (5.22)	0.024 (4.34)	0.027 (2.93)
12	<i>Buy portfolio return</i>	0.020 (4.98)	0.020 (4.44)	0.022 (4.07)	0.015 (3.10)
	<i>Sell portfolio return</i>	0.002 (0.83)	0.001 (0.4)	0.002 (1.27)	-0.005 (2.37)
	<i>Zero-cost momentum portfolio return</i>	0.018 (4.71)	0.019 (4.48)	0.020 (3.59)	0.020 (1.97)

Nevertheless when we kept the ranking period fixe, we notice that the zero-cost momentum portfolios return decreases each time the holding period increases. This result may be explained by the fact that over long holding period the stocks may know a change in their potential so we get lesser probability to observe the same continuation glorious tendency among its future returns. Especially, the ex-losers stocks may improve their performance among some long holding period and the ex-winners may get worse performance during some long holding period. That's why the zero-cost momentum portfolio that buys the ex-winners stocks and sells the last losers stocks provides lesser average returns over longer holding period.

So and as conclusion of this section, there is no evidence that the momentum effect phenomenon excludes the little stocks' markets, since we document a strong and persistent momentum effect overall the 16 temporal horizons distinguished. Therefore, the momentum effect seems to be a general phenomenon that ignores the size and the degree of development of the stocks market.

We notice that in the rest of the paper especially for the examination of the cross sectional risk characteristics related to the momentum strategies' returns we will consider in detail only the 6 months/ 6 months as mean and enough representative strategy².

3 Portfolios risk characteristics

In this section we explore whether the cross sectional risk differences among the winners and the losers portfolios' returns explain the Tunisian momentum profits. To achieve our purpose we proceed into two steps. In a first step we lead a descriptive study in which we aim to describe and to underline the

² Many earlier works are also focussed on the 6 months / 6months ([2, 3, 4, 8, 9, 10, 12, 14]....

cross sectional risk characteristics relating respectively to the winners and losers and portfolios' stocks. We are especially interested with the market, the SMB and the HML risk factors. Then and in a second step we try to validate these descriptive results econometrically through the estimation of the Fama and French three-factor model which regroup justly these especial three risk factors.

3.1 The descriptive study: a look at the cross sectional risk characteristics of the winners and losers portfolios' stocks

At this level we tend to look at the winners, losers and zero-cost momentum portfolios' stocks in order to reveal their cross sectional risk differences. Especially their respective market, SMB and HML factor risks. In three successive paragraphs we deal respectively with each one of these three factor risks.

3.1.1 The cross sectional market risk characteristics

To underline the market risk characteristic related to the winners, losers and momentum portfolios' stocks we examine their respective β coefficient, using as benchmark the CAPM model.

But first and before leading the CAPM model estimation we should construct first the required exogenous monthly returns series. Especially we are interested with the winners, losers and zero-cost momentum portfolios' monthly average returns that were observed during the considered holding period.

To be more explicit, we find useful to distinguish two paragraphs. In the first we construct the exogenous required returns temporal series and in the second we present the model' estimation results.

a. Portfolios returns' construction series

As we said earlier, we are interested in the rest of the paper exclusively by the 6 months/ 6 months portfolio momentum that we consider representative of all the other temporal horizons momentum portfolios.

As exogenous returns we need the winner, the loser as well as the zero-cost momentum portfolios monthly returns series. Especially we are interested with the relative portfolios average monthly returns' series realized during the holding period. The relative portfolios' stocks are formed based on the 6 months lagged ranking period.

The relative returns' series submitted to the estimation are constructed as follow: at the beginning of each month t , we rank the stocks in a descending order based on their monthly average realised returns during the period from the beginning of month $t-12$ to the end of month $t-7$ (the 6 months ranking period). Then we form the best performance' stocks decile and the worst performance stocks' decile. The first will be designed as the winner portfolio and the second will be designed as the loser portfolio. Then we compute the average monthly realised returns relative to each one of these two portfolios as well as the momentum portfolio during the period from beginning of month $t-6$ to the end of month $t-1$ (the 6 months holding period). The three average monthly returns over the 6 months holding period thus present the month t observation respectively relative to the winners, losers and zero-cost momentum portfolios. By this way we obtain the three average monthly returns' temporal series relating respectively to the winner, loser and zero-cost momentum portfolios.

Each portfolio monthly returns' series include 96 observations. It's true that the present research is led over an eight years period beginning from January 1998 to December 2004, but and since at the beginning of each month we need a 12 lagged monthly returns' observation, the data we use in the research will include only 84 observations (12 months *7 years). Each series begins from January 1999 and ends in December 2004.

b. The market risk momentum adjusted returns

Table 2 reports some revealing results that are different to those found by the earlier academic researchers led on the developed stocks' market ([8, 9, 11]...). Table 2 reports the CAPM loading coefficients of the winner, loser and the zero-cost momentum portfolios returns. Especially we had estimated the following model: $(R_t - R_{0t}) = \alpha + \beta (R_{mt} - R_{0t}) + \varepsilon_t$. The R_{0t} is the monthly zero-risk asset' returns. We consider as zero-risk asset' returns the short term treasury bonds' monthly returns realised during the research' period. The R_t is the monthly returns realised respectively by the winner, loser as well as the zero-cost momentum portfolio over the holding period. We consider as exogenous variable the abnormal return relative to each portfolio given by $(R_t - R_{0t})$. The coefficient α is the model constant. It underlines the market risk adjusted portfolio returns. R_{mt} is the market portfolio returns. It is estimated by the Tunindex³ monthly return. The coefficient β measures the portfolio' returns loading coefficient on the market returns variations.

Table 2: CAPM model estimation

Variables	Constant	Coefficient β
Abnormal winner portfolio' returns	0,0023 (4,71)	1,29 (2,51)
Abnormal loser portfolio' returns	-0,003 (-1,51)	0,15 (2,65)
Momentum portfolio returns	0,0053 (4,46)	1,14 (1,98)

In fact and when the prior literature asserts that the best performance of the winner portfolio seems to be no more risky than the worst performance (The β loading coefficient of the winner portfolio is significantly inferior to that of the

³ Tunindex is the most popular index used in the Tunisian financial market. It regroups the 25 most liquid stocks. It is considered as the most representative of the market evolution.

loser portfolio), and the momentum portfolio is offering some insurance against the risk market (the β loading coefficient of the momentum portfolio returns is negative and significant), the Tunisian winner portfolios seem to be more risky than the loser portfolios. The β loading coefficient of the winner portfolios' returns is 1.29 (2.51) compared to 0.15 (2.65) relating to the loser portfolios' returns.

Hence the Tunisian momentum portfolio returns show a β loading coefficient positive and significant of about 1.14 (1.98). That is the Tunisian momentum portfolio returns and contrary to the literature' results seem remunerating some underlying risk market since this portfolio is long on more market risky portfolio (winner portfolio) and short on less market risky portfolio (losers).

So some intriguing part of the Tunisian momentum seems to be resolved given that the best performance of the winner portfolios is driven by its more risky character relative to the worst performance of the loser portfolios which are less risky.

Nevertheless, the market risk adjusted abnormal returns of the momentum portfolio given by the constant persists positive and significant, it is about 0.0053 (4.46). That is the CAPM model doesn't explain the whole significant momentum portfolio returns and there is some significant portion that seems abnormal and doesn't remunerate the market risk.

3.1.2 The cross sectional SMB factor characteristics

In this paragraph we aim to describe the winners and losers portfolios' stocks, especially we tend to compare their respective size. Table 3 reports their respective mean size.

Table 3 reports descriptive statics related to the winner, loser portfolios stocks' size. These relative two mean size data were computed as follow: at the beginning

of each month t , we identify the winner stocks' decile as well as the loser stocks' decile based on their respective average monthly returns realised from month $t-12$ until month $t-6$. Then we compute the size of each stock including in each decile. The size of each stock is its market capitalisation observed at the end of the latest year. Finally we compute the mean size of each decile.

By doing so at the beginning of each month t , we get the two mean size temporal series related respectively to the winner and the loser' stocks.

Table 3: the mean size of the winners and losers portfolios' stocks

The winner portfolios stocks' mean size.	46 797 781
The loser portfolios stocks' mean size.	60 522 543
the all market stocks' mean size	66 181 631,8

This size descriptive study reveals and not as expected by JT [8] that the Tunisian winner' stocks are on average smaller than the loser' stocks. So they may be more risky than the loser' stocks, hence may be their better performance.

So and as preliminary results we assert that the size factor may surprisingly accounts for the Tunisian momentum strategies profits, since such strategies are long in smaller stocks and short in bigger stocks and therefore they may be associated with some underlying risk factor.

To be validated, this statement should be confirmed in the econometric study when we lead an estimation of the three-factor model.

Nevertheless, such revealing and unexpected results may highlight some illusory nature of the Tunisian momentum effects which may be simply related to some accounting aspect that is the winner stocks are winner not because of their exceptional last performance but only because of their associated little value which amplify mathematically their returns compared to the big value stocks that often show relative small returns. However such thesis may be considered with

scepticism since both the winner and losers stocks seem to be size homogenous especially both of them are small stocks according to the market size mean (their respective mean size are below the market mean size). However, further advanced researches are required in this particular size characteristic aspect.

3.1.3 The cross sectional HML factor characteristics

In this paragraph we look at the mean book to market (B/M) ratios related respectively to the winner and loser portfolios' stocks in order to deduce the cross sectional HML factor difference among them and eventually to look for some eventual explanation for the Tunisian momentum' profits under the HML factor. Table 4 reports the mean B/M ratios related respectively to the winner and loser portfolios' stocks.

Table 4 reports descriptive statics related to the winner, loser portfolios stocks' B/M ratios. These relative two mean ratios were computed as follow: at the beginning of each month t , we identify the winner stocks' decile as well as the loser stocks' decile based on their respective average monthly returns realised from month $t-12$ until month $t-6$. Then we compute the B/M ratio of each stock including in each decile. The B/M ratio of each stock is its book value divided by its market capitalisation value observed respectively at the end of the latest year. Finally we compute the mean B/M ratio of each decile.

By doing so at the beginning of each month t , we get the two mean B/M ratios temporal' series related respectively to the winner and the loser' stocks.

Table 4: the mean B/M ratios of the winners and losers stocks

Winner stocks' mean B/M ratio	0,786
Loser stocks' mean B/M ratio	0,817

We note that the winner stocks as well as the loser stocks are both well evaluated by the market and no one seem to be associated with an underlying HML factor. Nevertheless the winner stocks are associated with some lesser B/M ratio asserting that they are better evaluated by the market and that are less concerned with the HML factor. So the winner stocks are less risky than the losers stocks. That is and according to this descriptive study the HML factor may not account for the winner stocks' best performance.

As conclusion of this descriptive study that aim to underline the cross sectional risk differences between the winner and the loser portfolios' stocks, we find some revealing preliminary results that we should validate through the econometric study. In summary we find that the winner portfolio stocks are more risky over the market and the size risk factors, which may justify their continuous outperformance and solve the momentum' profits mystery.

However we couldn't expected any HML factor based explanation for the Tunisian momentum effect, since the winner portfolios stocks are less risky than the loser stocks.

3.2 The adjusted risk factor momentum' profits

In this second step we examine the adjusted risk factor momentum profits using as benchmark the Fama and French three-factor model. this econometric study aims to check the above preliminary descriptive results and to examine the extend to which the significant positive returns provided by the zero-cost Tunisian momentum portfolios load on the market, size and HML risk factors.

For the model estimation, and as exogenous data, we use the same average monthly returns' series relative to each portfolio as described and constructed in the earlier developed paragraph which deal with the CAPM model.

Table 5 reports the cross sectional risk characteristics of the winner, loser and zero-cost portfolios using the Fama and French three-factor model. Especially

we had estimated the following model: $R_t - R_{0t} = a_t + b_t (R_{mt} - R_{0t}) + c_t HML_t + d_t SMB_t + \varepsilon_{it}$. Where R_t is the relative portfolios monthly returns constructed as described above. R_{0t} is the monthly returns of the treasury bonds. $(R_t - R_{0t})$ represents the relative portfolios' abnormal returns. The R_{mt} is the tuniindex monthly returns. The HML_t is the highest book to market stocks' returns minus the lowest book to market stocks' returns. At the beginning of each year t we rank the stocks based on their past book to market ratios observed at the end of the latest year $t-1$. Then we regroup them in three equal weighted portfolios: the High book to market stocks' ratios, the medium book to market stocks' ratios and the low book to market stocks' ratios. These three portfolios' stocks persist available during only one year t . To obtain the monthly returns HML' series, we compute at the end of each month belong to the year t the difference between the highest and lowest book to market ratios portfolios' average returns. The SMB_t is the smallest size stocks returns minus the biggest size stocks' returns. The size of one stock is given by its market value capitalisation. At the beginning of each year t , we rank the stocks based on their size as observed at the end of the latest year $t-1$. Then we regroup them into two equally weighted portfolios the biggest stocks portfolios and the smallest stocks portfolios. These two stocks' lists persist available during only one year t . To obtain the monthly returns SMB' series, we compute at the end of each month belong to the year t the difference between the smallest stocks' average returns and the biggest stocks' average returns. The estimation covers the period from January 1999 to December 2004 including 84 monthly observations in each returns' series.

Table 5 reports the relative loading coefficient on the respective three risk factors related to the winner, loser and zero-cost momentum portfolios' returns. The results indicate that the winner portfolios load on the market risk with a coefficient of 0.26 (2.36) when the loser portfolios load on the market risk with a coefficient of 0.16 (2.68). That is the winner portfolios are more market risky than the loser portfolios hence their better performance than the loser portfolio. So the

best performance of the winner portfolio is simply the remuneration of a higher underlying market risk level relative to the loser portfolios which are less risky. So the three-factor model' estimation confirms the prior CAPM model' estimation which reveals that the winner portfolios stocks are significantly more market risky than the loser stocks.

Table 5: the Fama and French three-factor model estimation results

Variables	constant	Market	SMB	HML
Abnormal winner portfolio' returns	0,0019 (3,91)	0,26 (2,36)	0,42 (3,23)	-0,207 (-1,93)
Abnormal loser portfolio' returns	-0,0003 (-1,23)	0,16 (2,68)	0,11 (2,14)	-0,08 (-2,44)
Momentum portfolio returns	0,0022 (3,51)	0,10 (1,93)	0,31 (3,12)	-0,12 (-1,94)

Moreover the cross sectional market risk difference between the winner and loser portfolios is significant. In fact the momentum portfolio which long on winner and more risky stocks and short on loser and less risky stocks show a positive and significant loading coefficient on the market risk.

Thus again we find some explanation for the Tunisian momentum returns which seem remunerating some higher underlying market risk.

Table 5 confirms also the revealing descriptive results related to the size' factor and which are different to the prior academic researches [4, 9, 10]. We remind that these researches found that losers' portfolios are more sensitive to size factor than the winner portfolios and moreover the momentum portfolio was associated with a negative and significant loading coefficient on the size factor, offering by this way some insurance and guaranties against the size factor.

In this research we were surprised by some contrary results. Especially we found that the winner portfolios are more sensitive to the size factor than to the loser portfolios (the size factor sensitivity for the winner portfolios is 0.42 compared to 0.11 for the loser ones). So the Tunisian winner portfolios seem taking more advantage of the market remunerations to the small stocks than do the loser portfolio. We notice that this result were expected by the descriptive study when we found that the winner stocks are on average smaller than the loser stocks, hence their higher loading coefficient on the SMB factor.

So the better performance of the winner stocks compared to the loser stocks may be justified by their more risky nature under the size factor. Moreover the momentum portfolio loading coefficient on the size factor is 0.31 (3.12). That is the cross sectional size factor difference between the winner portfolios and the loser ones is positive and significant.

Thus another peace of the intriguing momentum returns seems to be resolved in the Tunisian financial markets. In fact the Tunisian momentum portfolios returns appear remunerating some underlying higher sensitivity to the size factor, since it is a portfolio long in relative small stocks and short in relative big stocks.

We justly remark that the risk adjusted abnormal returns of the momentum portfolios had decreased (it is about 0.0022 compared to 0.0053 in the CAPM estimation) consequently to the diminution of the mysterious unexplained abnormal returns.

However and concerning the HML factor sensitivities the results are somewhat similar to those advanced by the prior academic researches as well as those advanced by our prior descriptive study. Especially and as found [4] and [9], the loading coefficients of the three portfolios on the HML factor were all negatives. That is the loser, the winner and the momentum portfolios are all of them well established and evaluated by the market. Moreover we found also that the loser portfolios are more sensitive to the HML factor than the winner ones

(loading coefficient of the winners portfolios is -0.207 compared to -0.08 for the loser portfolios). That is the winner portfolios are better evaluated by the market than the loser portfolios, thus the winner portfolios are less risky than the loser portfolios. And the momentum portfolios are then long in less risky stocks and short in more risky stocks, offering by this composition some insurance against the HML factor (the loading coefficient is negative and significant is -0.12 (1.94)). So the HML factor fails to explain the remaining unexplained momentum portfolio' abnormal returns, indeed the HML factor adjusted momentum portfolios' returns seem to be improved rather than decreased.

Nevertheless and despite the explanations provided by the market and the size factor, the risk factor adjusted portfolios momentum returns persist positive and significant (the constant coefficient is 0.0022 (3.52)). That is some portion of the Tunisian momentum portfolios abnormal returns remain mysterious and resist to any based risk explanation expected by the CAPM and the three-factor model.

4 Conclusion

In this paper we lead a bi-dimensional comparative study in which we examine the differences as well the similarities between the developed stocks markets and the little stocks market, concerning the momentum effect' topic. Especially we tend first to explore whether the momentum effect is some phenomenon proper to the developed markets or it is a general phenomenon that deal also with the little markets. In particular and as example of emerging market, the study is run on the Tunisian stocks' market. Second we tend to examine the risk characteristic differences between the Tunisian stocks market' momentum compared to the developed markets' ones especially those documented by JT [8, 9].

The results are revealing. First and using the JT [8]' methodology over the period from January 1998 to December 2004, we identify a significant and strong momentum effect in the Tunisian stocks' return overall the 16 strategies explored.

So the momentum effect in stocks' returns seems to be a general phenomenon that resists to any stocks' market regardless to its development' degree. With such results the robust momentum effect becomes more mysterious and puzzling requiring further explicative researches.

Indeed the Tunisian momentum effect seems stronger and more pronounced (it provides an average monthly return of 2.43% compared to 1% related to JT [8]' momentum).

The stronger momentum effect' manifestation may underline that in a little emerging market such as the Tunisian one, the investors seem implementing more aggressive and more focalised momentum strategies than do the developed market' investors. This behaviour may refer to the little number of the listed securities. In fact, the little number of the listed securities in the Tunisian stocks markets would allow investors to better visualize and retain the winner stocks as well as the loser stocks. Thus all investors would focus and implement the momentum strategies with the same portfolios 'component. So the dispersion of the strategies 'profitability will be reduced, and the momentum effect seems stronger.

Nevertheless such statement that open some specific behavioural issue particular to little market' investors should be validated in further research.

Besides to their scales extend, we underline further particularities related to the associated risk factor associated to the Tunisian momentum compared to JT [8, 9]' momentum. Especially and as did JT [8], we had examined the cross sectional risk characteristic differences among the Tunisian ex-winners, the ex-losers and the zero-cost momentum portfolios, using the CAPM and the Fama and French three factorial models as benchmark.

Contrary to JT [9] who found that the ex-winners portfolios are less risky than the ex-losers portfolios and thus the zero-cost momentum portfolio offers some insurance against the market risk, the SMB factor and the HML factor, in this research we found that the Tunisian zero-cost momentum portfolio excess

returns is associated with some significant market risk as well as some size factor. Especially the Tunisian ex-winners portfolios seem more sensitive to the market variation and more sensitive to the SMB factor than the ex-losers portfolios. Indeed, the cross sectional differences relating to these two risk factors among these two portfolios is enough significant, thus the excess momentum portfolio returns seem remunerating some underlying excess market and size factors, thus, solving and at least partly some of their mysterious character.

Nevertheless and as found JT [9] also the Tunisian ex-winners portfolios seem less sensitive to the HML factor than the ex-losers portfolios. So the excess momentum portfolio returns couldn't be related to some HML factor. Indeed the cross sectional difference between their respective sensitivities is enough significant. That is, the Tunisian momentum portfolios seems offering some guaranties against the HML factor, as did the JT [8]' momentum.

Despite and regardless that the standard risk adjustment Tunisian momentum returns had decreased and not increased thanks to the significant underlying market and size loading factors, some significant part of the Tunisian momentum portfolios' abnormal excess returns remains unexplained and unsolved under any risk-based explanations offered by the CAPM and the three-factor models .

In conclusion this paper arouses mainly two further fields' researchers. First it's useful to lead similar studies in other emerging markets and examine to what extend the momentum effects presenting the same aspects compared to the momentum documented in the developed financial markets. Second this research joins the earlier academic researchers that assert the robustness of the momentum effect at least partially to the based-theory theories and we should look for emerging market momentum' reasons under the alternative behavioural theories.

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