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Disposition Effect: Cases of Tunisian Financial Market

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Abstract **The 'disposition effect' is the tendency to sell assets that have gained value ('winners') and conserve assets that have lost value ('losers'). A standard explanation of the disposition effect refers to prospect theory and, in particular, to the asymmetric risk aversion, according to which investors is risk-averse when faced with gains and risk-seeking when faced with losses.**
The disposition effect can be explained by the two features of prospect theory: the idea that people value gains and losses relative to a reference point (the initial buy price of shares), and the tendency to search for risk when faced with possible losses, and avoid risk when a certain gain is possible.
In this paper we study the impact of investor psychology, and more particularly the disposition effect on the predictability of Tunisian companies' returns in and outside the period of Tunisian revolution. Empirically, there is a significant relationship between unrealized capital gains and past returns which turns into insignificant in the period of revolution.

Keywords behavioral finance; disposition effect; prospect theory; unrealized capital gain (loss); tunisian stock market.

I. INTRODUCTION

In 1978, [1] stated, that the "efficient markets hypothesis is the fact that most established of all the social sciences". Unfortunately this bald assertion was shaken by a plethora of empirical literature, emphasizing the excessive volatility of financial markets. Despite a vigorous attack against highlighting the methodological biases associated with testing of volatility, the stock market crash of October 19, 1987 swept the hegemony of the theory of efficient capital markets. Then opened a new era of fruitful research, questioning basic assumptions of efficiency, and whose body is enshrined in the name of behavioral finance.

Behavioral finance challenges two fundamental assumptions of the theory of efficient markets, on the one hand the rationality of investors, on the other hand, the absence of arbitrage opportunity [2]. Regarding rationality, individual investors are subject to cognitive biases that alter their beliefs (expectations) and their preferences (attitude against the risk). Regarding the absence of arbitrage opportunities, it faces structural and institutional con The rest of this paper is organized as follows. In Section 2, we define the disposition effect, in section 3, we discuss a model that predicts the relationship between the disposition-prone stocks and returns and we explore its testable implications. Section 4 presents empirical data. Section 5 concludes the paper.

II. THE DISPOSITION EFFECT

The disposition effect, introduced into the finance literature by [3] relates to the tendency of investors to ride losses and realize gains. This runs counter to sound tax planning. With the availability of account level transaction data, the disposition effect has become a widely documented empirical regularity. Actually, subsequent to the well-known paper by [4] several studies find that investors are reluctant to unload assets at loss relative to the price at which they were buyed.
The available evidence shows that although greater investor sophistication is associated with less susceptibility to the disposition effect, professional traders are far from immune to it.
Reference [5] analyze the trading behavior of professional futures traders and find that while all traders hold losers longer than winners, the least successful traders hold losers the longest, while the most successful traders hold losers for the shortest time. Reference [5] report evidence of loss aversion among professional market makers at the Chicago Board of Trade, with the most compelling evidence concentrated in morning loser traders. Reference [6] find evidence of the disposition effect among professional investors in Israel, while results in Reference [7] show that managers of underperforming funds appear reluctant to sell their losing stocks, which is consistent with their being disposition prone.

III. METHODOLOGY

The data which is collected from the website of Tunisia stock exchange consists of daily observations of the closing prices and trading volumes of 24 Tunisian firms continuously listed.

The choice of such a sample is dictated by the availability and continuity of market data on current dividends and shares traded.

A. Presentation of The Model

We analyze the following regression:

$$r_t^j = a_0 + a_1 r_{-1;0} + a_2 r_{-12,-1} + a_3 r_{-36,-13} + a_4 \overline{V} + a_5 s + a_6 g$$

The model is estimated for the whole sample period (ie the period from January 2003 to December 2011) and for the period of the revolution from January 2010 until the end of our study period and finally for the period off revolution, and this to be able to detect an effect of the Tunisian revolution on the predictability of returns induced by investors subject to the disposition effect.

B. The Dependent Variable

The dependent variable in this model is the stock performance. Our choice of this variable as the basis for this study is because we want to test the impact of the disposition effect on the predictability of stocks returns.

C. The Independent Variables

The explanatory variables of this study are:

1) Past Returns Calculated on Cumulative Three Horizons:Yields delayed by a month, $r_{-1:0}$ which are used to control the short-term reversal effect described by [9]. Indeed, this author showed that past returns in the short term (one month) are inversely related to future returns.

Yields delayed by twelve month, $r_{-12;-1}$ are used to monitor the effect of momentum or relative continuity in yields of [10]. In their work,the short term refers to periods ranging from six to twelve months. Indeed, the authors provide evidence that there is positive autocorrelation of stock returns in the short term.

Yields delayed by thirty six months, $r_{-36,-13}$ are intended to control the reversal effect of [11]. The authors have indeed revealed a phenomenon of reversal trend of long-term that leads to a negative autocorrelation of returns.

2) Market Capitalization: We're adding monthly market capitalization of each security to monitor the effect of increase in the performance of small businesses. The size effect is probably the anomaly the most treated by practitioners as well as theorists. Reference [12] was the first author who was able to show a negative relationship between stock performance and company size measured by market capitalization.

3) The Trading Volume: We monitor the possible effects of the trading volume, such as those described by [13] and [14] inserting the average turnover ratio (defined as the trading volume divided by the number of shares outstanding during the last twelve months. These authors showed that the increase in market returns leads to the increase the trading volume.

4) The Capital Gain: Finally, we study the coefficient g, a proxy for capital gains (losses) and is the critical variable in our study.

The study period runs from the beginning of the month of January 2003 to the end of December 2011.

VI. THE ESTIMATION RESULTS

Table I presents the results of estimating the cross sectional regressions run each month on securities Tunisian companies for our entire sample period. The coefficients correspond to the average monthly estimated coefficients.

TABLE I

Period	Constant	$r_{-1:0}$	$r_{-12:-1}$	$r_{-36:-13}$	S	V	g
Entire period	-0.318819 (-19,3273)	0.981117 (591.9743)	-7.87E-14 (-0.895947)	3.79E-07 (0.026763)	0.000272 (0.747010)	0.313961 (21.50785)	0.930217 (20.40096)
Period Excluding Revolution	-0.766236 (-6,13377)	1.445474 (42.23595)	-0.000480 (-0.549372)	-5.16E-05 (-0,19308)	0.035933 (3.986665)	-0.006688 (-2,01831)	8.937057 (11.08393)
Period of revolution	0.069864 (0.33619)	-0,062478 (-0.28452)	0.057163 (10.42579)	0.00 2241 (0.215651)	-0.008492 (-0.45459)	0.079343 (0.61242)	0.027725 (0.145890)

**Statistical significance at 5% level

First, we examine the performance coefficient delayed by one month, $r_{-1;0}$. It appears to be positive and significant for the period excluding revolution and the entire period and it becomes insignificant during revolution indeed, for the first two periods the coefficient a_2 is quite high (of the order of -0.31 and 0.76 respectively for the entire period and beyond revolution). It emerges that there is a reversal effect in the short term highlighted by [15] on the U.S. market. This relationship can be explained by the fact that there are differences between the bid and ask prices.
In addition, the coefficient of the variable yield delayed by twelve months, $r_{-12;-1}$ is not

significant for the whole period and for the period excluding revolution but significant in the period of revolution. So the momentum has an effect on expected returns.
Furthermore, we also find that the coefficient of delayed performance by thirty-six months is not significant in the whole period and the off revolution and there is not a long-term reversal effect. This coefficient is not significant in the period of revolution that is to say, the short-term reversal effect does not exist in this period returns but becomes insignificant in times of revolution. This positive relationship means more trading volume increases, higher the expected return is. So trading volume acts positively on current yields. These results are consistent with those found by [16] who used a VAR model linking yields and trading volume and found that yields are heavily dependent on trading volume.

However, in times of revolution, the turnover rate coefficient is not significant; hence we can say that the significant relationship between returns and trading volume no longer exists as the size effect due to revolution. We can explain this result by the fact that in times of revolution, investors subject to the disposition effect become more cautious in making transactions.
Finally, and observing the seventh column of the Table which is related to the variable unrealized capital gain (loss) the result is a latent positive and significant relationship between the monthly returns of the securities and the variable that measures the capital gain. This can be explained by the fact that the variable g was estimated taking into account the historical returns of securities. By referring to the first model, which relates the variable unrealized capital gain (loss) and past performance of securities, we realize that we have already unveiled a relationship between the variable measuring capital gains and returns. Therefore, there is a bivariate relationship between the unrealized capital gain (loss) and monthly stocks returns. So we can infer that the behavior of investors subject to the disposition effect based on capital gain influence positively on stock returns. This finding may be explained that these investors define the reference point by which they will determine their area of unrealized gains and their area of unrealized losses in the curve of the "prospect theory" of [17] and proceeding thereafter by issuing orders for the sale or purchase to accomplish finally tangible gains.

However, this relationship is no longer significant in period of revolution. This finding is expected because investors tend to sell their losers shares as the risk of increased losses increases during this period. This is not identical to that predicted the disposition effect which reflects a tendency to delay the sale of losers stocks.

V. CONCLUSION

According to the size effect demonstrated by [18] a positive relationship between monthly returns and the logarithm of the market capitalization of

the securities is observed for the off revolution. Consequently, the size of the company influences positively capital gain. This result shows that large capitalization companies tend to have higher unrealized gains. This reflects the large companies that have experienced high returns in the past not captured by our variables of past returns tend to have larger capital gains. However, this size effect disappeared for the entire period and for the period of revolution and the coefficient on market capitalization became insignificant.

The results appeared in the Table for the variable turnover show a positive significant relationship sometimes (the entire period) and sometimes negative (the off-revolution) between trading volume and current stock The disposition effect which is an individual behavior showing optimization anomalies resulting of the tendency to sell winners too quickly and to hold onto losers for too long.

This anomaly will lead to irrational behavior of selling winning stocks too soon and too late titles losers. This effect is measured based on a reference point (the prospect theory) through which investors calculate their earnings or their actual losses.

We did this empirical study on Tunisian companies in order to examine the impact of the presence of investors' disposition prone on the predictability of stocks returns.

To conclude, we can summarize that the results show a significant relationship between unrealized gains and past returns becomes insignificant during revolution.

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