The Impact of Market Anomalies on Investment Decision in Egyptian Stock of Exchange

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Abstract in English:

This paper examines the market anomalies impact of the investment decision in the Egyptian Stock of Exchange. A comprehensive review of the Capital Assets Pricing Model (CAPM), Efficient Markets Hypothesis (EMH) and market anomalies will be studied. The market anomalies can be expressed by size, value, and momentum effects In our study, we will describe how to compute these effects. The analysis of data collected from the Egyptian Stock of Exchange during the period 2004 to 2015 was conducted and the value, size, momentum were computed according to EMH. Testing Hypotheses and related statistical analysis will be investigated. Finally, a discussion of the results and the conclusion of the study.

Key Words:

CAMP, Market anomalies, EMH, value effect, size effect, momentum effect.

المخلص باللغة العربية:

تبحث هذة الدراسة في تأثير تشوهات السوق علي قرار الاستثمار في البورصة المصرية. و تتناول هذه دراسة مراجعة شـاملة لنموذج تسعير الأصول الرأسمالية ، و افتراضيات كفاءة السوق ، و حالات السوق الشاذة عن القاعدة. ويتم التعبير عن شـذوذ السوق من خـلال تـأثيرات (الحجم و القيمـة و الزخم) ، هذه الدراسه يتم وصف كيفية حساب هذة التأثيرات ومن ثم اجراء تحليل للبيانـات المجمعة من البورصـة المصرية خـلال الفترة (٢٠٠٤ : ٢٠١٥) و فحص الفرضيات و التحليل الاحصـائي المتعلق بها. و أخيرا ، اجراء مناقشة نتائج و ملخص الدراسة.

Introduction

One of the pillars on which the financial economy is based on the concept of market efficiency. A stock market is efficient when the competition between the different participants involved in it, leads to a situation of equilibrium in which the market price of a security is a good estimate of its theoretical or intrinsic value. All investors have the same information, information that is included in the prices. In this way, nobody can beat the market without assuming more risks as the prediction of the quotes is not possible. They also assume that investors at the aggregate level act rationally in making their decisions. The conjunction of market equilibrium with the investor's rationality means that prices are objective and that they are not derived from their fundamental value (Fama, 2014).

Since the last century, the validity of this hypothesis has been debated. Supporters of market efficiency claim that the prices of financial assets quickly assimilate and include new information. They also believe that investors' expectations are rational and reflect the true fundamental value of the assets. Accordingly, prices are set by the free play of supply and demand and it is useless to use technical analysis to predict future prices of assets (Lee et. al, 2002).

The economy lives a constant tension between the positive vision (what the economy is) and the normative vision (what the economy should be). The positive view is the predominant one for half a century in all the economic "sciences", contrary to normative economics, which is subjective since it includes value judgments. From the point of view of financial economics, the positive vision tries to understand how agents work, and by extension the markets, in their decision making, using an important quantitative apparatus, and carrying out a series of assumptions such as, perfect markets or rational behavior of agents. However, these assumptions can often be questioned by observing biases in the agents' behavior. (Daniel et. al, 1998).

Objective of the Study and Research Question

The aim of this study is to the impact of market anomalies on investment decision. This research is Investigated to achieve the following main objectives:

1. Providing a comprehensive review of the literature on the debate between EMH and Anomalies.
2. Studying size effect, value effect and momentum as the main anomalies in asset pricing literature and the extent of their existence in the Egyptian Stock of Exchange.

The research questions of our study is:

Q1: What is the EMH and its relation to anomalies?

Q1: What is the main factors of anomalies?

Q2: How to measure factors of anomalies; size, value, and momentum?

Q3: which of the anomalies can impact the Egyptian Stock of Exchange?

Research Gap

As we stated above, we found that traditional finance focuses on what managers should do "Rational Equations" rather than what they actually do "Psychology", since emotions affect human beings' decisions. However, few Researcher have shed the light on the factors that cause anomalies between EMH and behavior finance which are:

1. **Size Effect**: The degree to which the size of a company's capital makes anomalies in the investment decision.
2. **Value Effect:** The degree to which the value of a company's stock makes anomalies in the investment decision.
3. **Momentum:** The degree to which the past losers and winners makes anomalies in the investment decision.

We tend to fill these research gaps in our study.

Review of Literature

The aim of this section is to provide a comprehensive review of the literature on EMH using CAPM as the main asset pricing model that can explain there anomalies.

This section is divided into three main parts, the first part aims to explain the CAPM which assumes that investors are risk averse and, how choosing among portfolios to maximize return and minimize the risk. The second part presents the EMH and discuss versions of EMH. The third part explains the anomalies and then studying size effect, value effect and momentum as the main anomalies in asset pricing literature.

The Capital Asset Pricing Model (CAPM)

The basis of the CAPM is the portfolio theory with a riskless asset and unlimited short sales. The model does not consider only the decision of a single investor, but aggregate them to determine a market equilibrium. In portfolio theory the price of an asset was exogenously given and could not be influenced by any investor. Given this price he formed his beliefs on the probability distribution. Those beliefs were allowed to vary between investors. In this section asset prices (or equivalently expected asset returns) will no longer be exogenously given, but be an equilibrium of the market. The prices of assets

equal their fundamental value, a high current price results in a low expected return in the next period and a low current price in a high expected return. In the same way in order to expect a high return, the price has to be low and for a low expected return a high price is needed.

The CAPM assumptions imply that the market portfolio M must be on the minimum variance frontier if the asset market is to clear. This means that the algebraic relation that holds for any minimum variance portfolio must hold for the market portfolio, if there are N risky assets: (Fama and French; 1992,1993)

$$E(R_i) = E(R_{ZM}) + [E(R_M) - E(R_{ZM})] * b_{iM}, \quad i = 1,2, \dots, N$$

where:

- $E(R_i)$ is the expected return on asset (i),
- $E(R_M)$ is the expected market return,
- $E(R_{ZM})$ is the expected return on assets that have market betas equal to zero, which means their returns are uncorrelated with the market return,
- b_{iM}, the market beta of asset (i), is the covariance of its return with the market return divided by the variance of the market return.

The first term on the right-hand side is the minimum variance condition, and the second term is a risk premium.

Thus, the CAPM assumptions are:

- No transaction costs and taxes
- Assets are indefinitely dividable
- Each investor can invest in every asset without restrictions
- Investors maximize expected utility by using the mean-variance criterion
- Prices are given and cannot be influenced by investors (competitive prices)
- The model is static, i.e. only a single time period is considered
- Unlimited short sales
- Homogeneity of beliefs
- All assets are marketable

The Efficient Market Hypothesis (EMH)

The definition of an efficient market as, given by Fama (1965), is a market in which prices always "fully reflect" available information is called "efficient". With this definition in an efficient market the price should always equal the fundamental value that is determined according to the information available. Sufficient, but not necessary, conditions for a market to be efficient are. No transaction costs for trading the asset, all information is available at no costs for all market participants, all market participants agree in the implications information has on current and future prices and dividends. Three forms of efficiency are distinguished in the literature: weak, semi strong and strong efficiency. These forms differ only in the set of information that has to be incorporated into prices. Weak efficiency uses only information on past prices and returns, semi strong efficiency includes all publicly available information and the strong form includes all information available to any market participant including private information.

The efficient markets hypothesis (EMH) suggests that profiting from predicting price movements is very difficult and unlikely. The main engine behind price changes is the arrival of new information. A market is said to be "efficient" if prices adjust quickly and, on average, without bias, to new information. As a result, the current prices of securities reflect all available information at any given point in time. Consequently, there is no reason to believe that prices are too high or too low. Security prices adjust before an investor has time to trade on and profit from a new a piece of information.

The key reason for the existence of an efficient market is the intense competition among investors to profit from any new information. The ability to identify over- and underpriced stocks is very valuable (it would allow investors to buy some stocks for less than their "true" value and sell others for more than they were worth). Naturally, as more and more analysts compete against each other in their effort to take advantage of over- and under-valued securities, the likelihood of being able to find and exploit such mis-priced securities becomes smaller and smaller. In equilibrium, only a relatively small number of analysts will be able to profit from the detection of mis-priced securities, mostly by chance. For the vast majority of investors, the information analysis payoff would unlikely to outweigh the transaction costs.

The most crucial implication of the EMH can be put in the form of a slogan: Trust market prices! At any point in time, prices of securities in efficient markets reflect all known information available to investors. There is no room for fooling investors, and as a result, all investments in efficient markets are fairly priced, i.e. on average investors get exactly what they pay for. Fair pricing of all securities does not mean that they will all perform similarly, or that even the likelihood of rising or falling in price is the same for

all securities. According to capital markets theory, the expected return from a security is primarily a function of its risk.

The price of the security reflects the present value of its expected future cash flows, which incorporates many factors such as volatility, liquidity, and risk of bankruptcy.

However, while prices are rationally based, changes in prices are expected to be random and unpredictable, because new information, by its very nature, is unpredictable. Therefore, stock prices are said to follow a random walk.

Market Anomalies

The term anomaly can be defined as a pattern of behavior not explained by an asset valuation model. Are all those behaviors of the prices of securities that can't be explained by the existing financial theory. That is, those market behaviors that can't be predicted or explained by the efficient market theory. (Berk, 1995) The knowledge of these irregular behaviors implies that extraordinary returns can be obtained which allow the market to be beaten. In this way, the existence of anomalies in the yields of listed securities questions the efficiency of the market, since it is possible to predict, in certain cases, the evolution of the expected returns.

Market anomalies are behavioral patterns that are apparently inconsistent with the market efficiency hypothesis because they imply the appearance of abnormal returns. In other words. Suppose that a model supported by the efficiency hypothesis (for example, the CAPM) establishes that the expected return for an asset at the end of the next temporary period (for example, a year) is x%. After that time period, if the return generated by the asset is different from that estimated by the model, and this difference is statistically significant (the calculation is made for a sufficient number of assets that allows us to draw conclusions in terms of statistical goodness), then we say that there is an abnormal return.

Abnormal returns (anomalies) can be the consequence of two possible situations (Knez and Ready, 1997):

1. The market is inefficient and does not adequately take into account the risk associated with the assets.
2. The market is efficient.

The abnormal returns, the anomalies, appear because the model used to obtain the expected returns is a simplified representation of reality, and omits relevant risk factors correlated with the anomaly found. Changing the model to a more precise one, these abnormal returns could disappear, evidencing that in reality they were not the result of inefficiency, but of the mathematical model used to measure the expected return according to the risk assumed.

Fama and French (1993) indicates, rightly, that trying to contrast Efficiency is to test both hypotheses simultaneously, and therefore, we arrive at the situation that the efficiency hypothesis is in contrastable because it cannot separate both aspects. There is even the third possibility of chance. By changing the sample and the time horizon, the anomaly may not appear, and it may simply have been an effect of chance.

The post-CAPM models are attempts to improve the accuracy of the models, adding few explanatory variables and indicators of the inherent risk to the assets, which allow us to estimate more precise expected returns, and therefore mitigate the problem of the model. In any case, next we will make a brief review on some of the most outstanding anomalies published in recent decades: (French, 2015)

(1) Size Effect:

Depending on market capitalization (the product of multiplying the number of shares by the price of the company), companies can be classified into large and small. Investors show more tracking of large companies than small ones. Therefore, it is the actions of large companies that present significantly higher returns. Investors are not generally very interested in small companies and therefore are undervalued and their price is far from its value.

The essential reason that investors pay less attention to small businesses is because the information from these companies is less accessible (Arbel and Strebel, 1982). Although it should be noted that when investors look at the actions of small companies, the returns of smaller companies, or low market capitalization, significantly outperform those of larger companies since investors will demand a rate of superior performance in exchange for investing in less liquid and more risky securities (Amihud and Mendelson, 1991). Banz (1981) and Reinganum (1981) were the first authors to show that small capitalization companies obtain more returns than large companies.

They examined the empirical relationship between the return and the total market value of NYSE common stocks. It is found that smaller firms have had higher risk adjusted returns, on average, than larger firms. This 'size effect' has been in existence for at least forty years and is evidence that the capital asset pricing model is mis-specified.

The size effect is not linear in the market value; the main effect occurs for very small firms while there is little difference in return between average sized and large firms. It is not known whether size per se is responsible for the effect or whether size is just a proxy for one or more true unknown factors correlated with size.

Roll (1981) and Edmister (1983) found that the risk of small companies was underestimated because the securities of these companies are negotiated less frequently than large companies. Keim (1983) also found that the size effect occurs more frequently in the month of January and more precisely in the first two weeks of this month. In all these cases it would be possible to beat the market obtaining significant returns and greater than those of the market, which implies a possible questioning of market efficiency.

Therefore, using strategies according to the existence of the previous anomalies, it is possible to obtain extraordinary benefits in certain periods of the year, or negotiation, and depending on some characteristics of the companies that are incompatible with a rational market.

(2) Value Effect:

The value effect is tendency of value stocks with low prices relative to their fundamentals to outperform growth stocks with high prices relative to their fundamentals. Alternative value measures used in the literatures are:

- B/M – the book value of equity divided by the market value of equity.
- E/P – the earnings after taxes divided by the market value of company's shares.
- Past Sales Growth–the compounded growth rate in net sale for three years' portfolio formation.

Basu (1977) examined the empirical relationship between earnings' yield, firm size and returns on the common stock of NYSE firms is examined in this paper. The results confirm that the common stock of high E/P firms earn, on average, higher risk-adjusted returns than the common stock of low E/P firms. This E/P effect is clearly significant even if experimental control is exercised over differences in firm size, i.e., the effect of size, as measured by the market value of common stock, is randomized.

Formal statistical evidence of the value effect was presented by Stattman (1980) and Rosenberg, et. al. (1985). They used the book to market ratio as a value indicator. Davis et. al. (1994) confirmed the value effect in US stock markets. Chan et al. (1991) and Capaul et al. (1993) confirmed the value effect, but in outside the US markets. Around same time as early size-effect papers, Basu (1977) noted that firms with high earnings-to-price (E/P) ratios earn positive abnormal returns relative to the CAPM.

Many subsequent papers have noted that positive abnormal returns seem to accrue to portfolios of stocks with high dividend yields (D/P) or to stocks with high book-to-market (B/M) values. Schwert (1978) made the important

observation that such evidence was likely to indicate a fault in the CAPM rather than market inefficiency.

In other words, turnover and transactions costs would be low and information collection costs would be low. If such a strategy earned reliable "abnormal" returns, it would be available to a large number of potential arbitrageurs at a very low cost. More recently, Fama and French (1992, 1993) have argued that size and value (as measured by the book-to-market value of common stock) represent two risk factors that are missing from the CAPM. In particular, they suggest using regressions of the format measure abnormal performance:

(3) The Momentum Effect:

DeBondt and Thaler (1985) found an anomaly whereby past losers have higher average returns than past winners, which is a "contrarian" effect.

On the other hand, Jegadeesh and Titman (1993) found that recent past winners holding portfolios formed of past returns out-perform recent past losers, which is a "continuation" or "momentum" effect. They documented that strategies which buy stocks that have performed well in the past and sell stocks that have performed poorly in the past generate significant positive returns over 3- to 12-month holding periods. They found that the profitability of these strategies are not due to their systematic risk or to delayed stock price reactions to common factors. However, part of the abnormal returns generated in the first year after portfolio formation dissipates in the following two years. A similar pattern of returns around the earnings announcements of past winners and losers is also documented.

Fama and French found no estimates of abnormal performance that are reliably different from zero based on the long-term reversal strategy of DeBondt and Thaler (1985), which they attribute to the similarity of past losers and small distressed firms.

On the other hand, Fama and French are not able to explain the short-term momentum effects found by Jegadeesh and Titman (1993) using their three-factor model. The estimates of abnormal returns are strongly positive for short-term winners.

Methodology of the Study

This study considers a comparison study between EMH and behavioral finance that measures stock market anomalies. These anomalies are Size Effect, Value Effect and Momentum depending on 130 companies listed in the Egyptian Stock of Exchange during the period between 2003 and 2016.

The size effect is studied using the following steps:
1. Calculating Monthly Return: $(Price_t - Price_{t-1}) / Price_{t-1}$
2. Forming portfolio:
   - Get the market cap of all listed stock in June of year t:
   - Monthly Current Price * Outstanding Shares
   - Calculate the median market cap of all stocks in June of every year.
   - Sorting companies based on market cap of each year.
   - Stocks whose market cap is lower than median are classified as small stocks (0) , stocks whose market cap is higher than median are classified as big stocks (1) .
   - Value weighted return of the small & big portfolio is calculated from July of year t till June of year (t + 1).
   - All the previous steps are repeated every June.
3. Calculating Weight average return
   - (market Cap / Total Average market cap)* return for every small company each month
   - (market Cap / Total Average market cap)* return for every large company each month
4. Calculating Return of the portfolio: sum of weight average return for every small and large company independently each month for all companies annually.

The value effect is studied using the following steps:
1. Calculating Return: $(Price_t - Price_{t-1}) / Price_{t-1}$
2. Determine B/M ratio= Total monthly equity (each company) / Ending annual CAP
3. Identifying Median every June of year [t] based on B/M ratio calculated as BM at fiscal year end[t = 1] over December market cap of year[t − 1]
4. Forming portfolio:
   - Get the ending market cap of all listed stock at Dec. of year t.
   - Sorting companies based on B/M Ratio of each year.
   - Stocks whose B/M ratio is lower than median are classified as growth stocks (0) , stocks whose B/M ratio is higher than median are classified as value stocks (1) .
   - Value weighted return of the growth & value portfolio is calculated from July of year t till June of year (t + 1).
   - All the previous steps are repeated every June.
5. Calculating Weight average return:
   - (B/M / Total average market cap) * return for every growth company each month

- (B/M / Total average market cap) * return for every large company each month
6. Calculating Return of the portfolio: sum of weight average return for every growth and value company independently each month

The momentum effect is studied using the following steps:

1. Calculating Return: ($Price_t$ – $Price_{t-1}$) / $Price_{t-1}$
2. Determine Average Return = Average return over the previous [12] months. [t – 12 each month]
3. Forming Portfolio:
   - Sorting companies based on average return of different companies' returns each year.
   - Stocks whose Return is lower than average return are classified as winner stocks (0) , stocks whose Return is higher than average return are classified as loser stocks (1) .
   - Value weighted return of the winner & loser portfolio is calculated from July of year t till June of year (t + 1).
   - All the previous steps are repeated every June.
4. Calculating Weight average return
   - (average return / Total Average return) * return for every winner company each month
   - (average return / Total Average return) * return for every loser company each month
5. Calculating Return of the portfolio: sum of weight average return for every winner and loser company independently each month

Data Collection and Research Instrument Description

We investigate the issue of returns to momentum, value, and size factors in the market based on all stocks listed on the Egyptian Stock Exchange [2004 –2015] where the secondary data came from Egyptian Consumer Confidence Index about stock price and volume of trading.

There researcher will also rely on data about stock prices and volume of trading to divide the stocks into two separate portfolios based on the following characteristics:

- Size Effect: Let (S) stands for "Small-Sized Companies" and (B) stands for "Big-Sized Companies. (Banz, 1981)
- Value Effect: Let (V) stands for "Value" and (G) stands for "Growth". (Basu, 1976)

- Momentum Effect: Let (W) stands for "Winners" and (L) stands for "Losers". (Titman,1993)

Then the researcher would calculate the difference within each category:

- ✓ If the difference between (S) and (B) is positive, there would be a "Size Effect".
- ✓ If the difference between (V) and (G) is positive, there would be a "Value Effect".
- ✓ If the difference between (W) and (L) is positive, there would be called "Momentum Effect".

Results and Discussions

This section is devoted to the statistical analysis of the quantitative data collected through firms form the Egyptian Index at the period from 2004 to 2015.

Descriptive Statistics

This subsection provides the descriptive analysis of the individual variables used in this study. Descriptive statistics provide a summary of what a research has found. Means and standard deviation and measures of range (maximum and minimum) of all the variables are be provided. The results of descriptive statistics in this study include the descriptive statistics for the size, value, momentum effect by months (almost 130 month).

Table (1) summarizes the descriptive statistics of the individual variables: size, value, momentum effects by months. From table (1), one can indicate the following results:

1. The average monthly returns of small firms portfolio based on BV/MV between 2004 and 2016 was -0.024%. The standard deviation is 0.477%. The lowest and highest monthly returns of small firms were -5.279% and 0.323% respectively during period of 2004-2016. While the average monthly returns of large firms portfolio based on BV/MV between 2004 and 2016 was 0.015%. The standard deviation is 0.101%. The lowest and highest monthly returns of large firms were -0.313% and 0.300% respectively during the same period.

2. The average monthly size effect between 2004 and 2016 was -0.158%. The standard deviation is 0.787%. The lowest and highest monthly returns of size effect were -3.634% and 0.716 % respectively during the same period.

Table (1): Monthly descriptive statistics of size, value, and momentum effects from January 2004 to February 2016

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Average monthly return of small firms portfolio based on Market Cap.	129	-5.2787847	0.3229130	-0.02393755	0.4769297033
Average monthly return of large firms portfolio based on Market Cap.	122	-0.3129968	0.2999709	0.015479794	0.1007505929
Size effect	126	-3.6343209	0.7163868	-0.15811286	0.7868038114
Average monthly return of Growth portfolio based on BV/ MV	126	-3.6211042	0.3132015	-0.01359018	0.3421806784
Average monthly return of Value portfolio based on BV/ MV	125	-0.7869384	3.7562268	0.145678856	0.7361024056
Value effect	130	-5.3856496	0.3212642	-0.07656122	0.6532300530
Return of the portfolio loser	129	-1.0000000	0.0086095	-0.07563852	0.1016157138
Return of the portfolio winner	129	-0.0033164	0.7640058	0.17176978	0.1299113366
Momentum effect	129	0.0793207	1.0000000	0.247408307	0.1404556974

3. The average monthly returns small firms portfolio based on return (growth) between 2004 and 2016 was -0.013%. The standard deviation is 0.342%. The lowest and highest monthly returns of growth firms were -3.621% and 0.313% respectively during period of 2004-2016. While the average monthly returns of large firms portfolio based on return (value) between 2004 and 2016 was 0.146%. The standard deviation is 0.736%. The lowest and highest monthly returns of value firms were -0.787% and 3.756% respectively during the same period.

4. The average monthly value effect between 2004 and 2016 was -0.077%. The standard deviation is 0.653%. The lowest and highest monthly returns of value effect were -5.385% and 0.321 % respectively during the same period.

5. The average monthly return of the portfolio loser between 2004 and 2016 was -0.076%. The standard deviation is 0.102%. The lowest and highest monthly returns of the loser were -1.000% and 0.009% respectively during period of 2004-2016. While the average monthly return of the portfolio winner between 2004 and 2016 was 0.172%. The standard deviation is 0.130%. The lowest and highest monthly returns of the winner were -0.003% and 0.764% respectively during the same period.

6. The average monthly momentum effect between 2004 and 2016 was 0.247%. The standard deviation is 0.140%. The lowest and highest monthly returns of value effect were 0.079% and 1.000% respectively during the same period.

Correlation between Variables

To study the relation between variables of our study and the interaction between classifications of these variables with others, one can compute the Pearson correlation coefficient. The correlation can be determined if there are any significance statistically relation between each two different variables.

The following table summarizes the correlation of the individual variables: size, value, momentum effects by months.

Table (2): Monthly correlation between size, value, and momentum effects from January 2004 to February 2015

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Average monthly return of small firms portfolio based on Market Cap	1					
(2) Average monthly return of large firms portfolio based on Market Cap	**-0.042**	1				
(3) Average monthly return of Growth portfolio based on BV/MV	0.077	0.098	1			
(4) Average monthly return of Value portfolio based on BV/MV	0.092	0.159	**0.072**	1		
(5) Return of the portfolio loser	-0.033	0.110	0.042	0.087	1	
(6) Return of the portfolio winner	-0.193*	0.090	0.064	0.120	**0.283****	1

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

From the correlation matrix in the above table between average returns for size, value, and momentum effects by data collecting monthly, the following results can be indicated:

1. There is a negative weak ($r = -0.042$) but non-statistically significance correlation between average monthly return of small firms portfolio and average monthly return of large firms portfolio based on BV/MV.

2. There is a positive weak ($r = 0.072$) but non-statistically significance correlation between average monthly return of small firms portfolio and average monthly return of large firms portfolio based on return.

3. There is a positive weak ($r = 0.283$) and statistically significance correlation at level 1% of significance between return of the portfolio loser and return of the portfolio winner.

The graphical representation for the relationship between size, value, and momentum effects by months can be showed in the following figures.
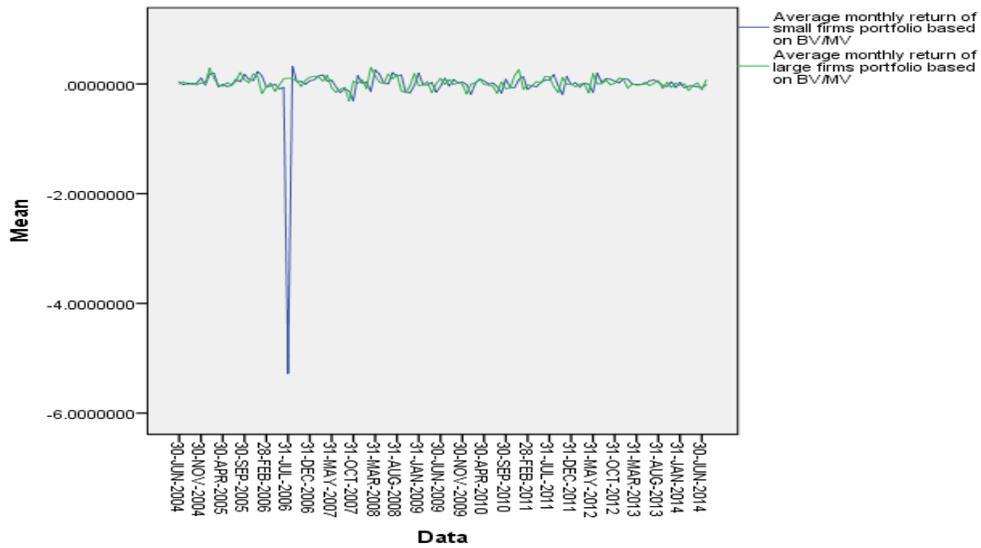
Figure (1): Lines of average monthly returns of the small and large firms based on BV/MV
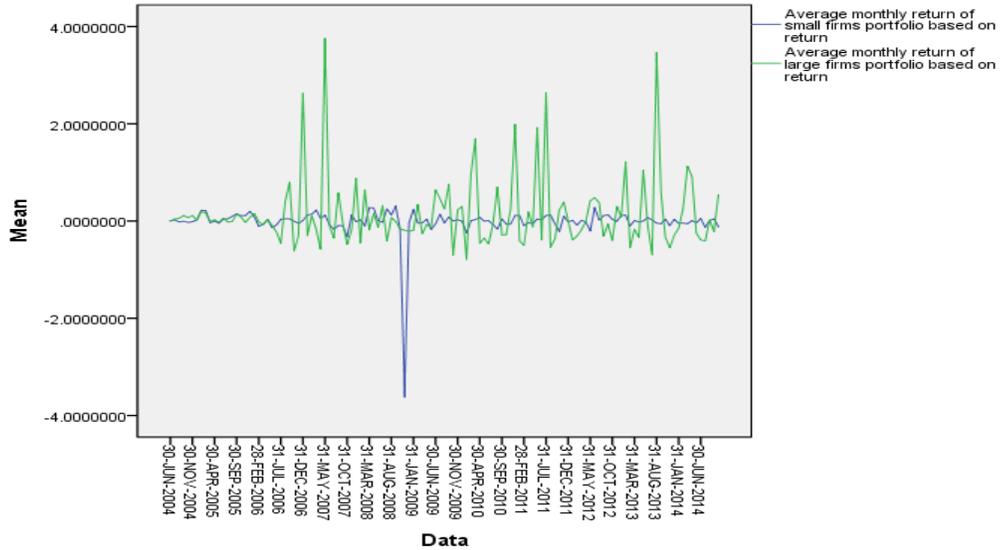

Figure (2): Lines of average monthly returns of the small and large firms based on returns
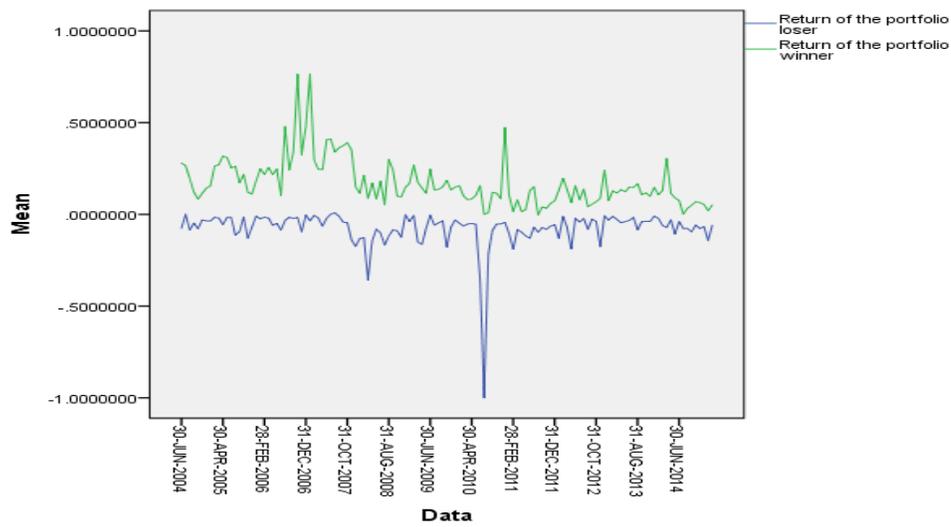
Figure (3): Lines of average monthly returns of the portfolio for the loser and the winner
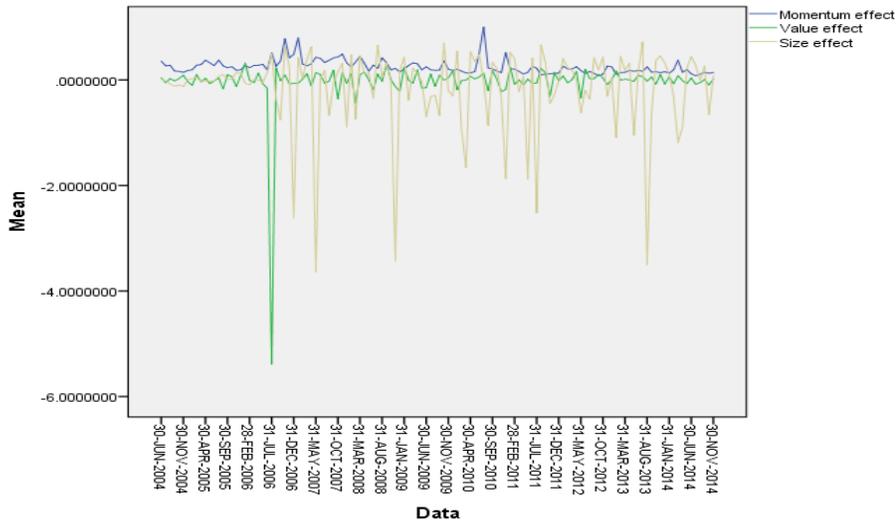

Figure (4): Lines of average monthly of the size, value, and momentum effects

Testing Hypotheses for Difference Between Classifications of Size, Value, and Momentum

This subsection provides the testing of the hypothesis of the differences between variables classifications of our study. The aim is to investigate if there is a statistical difference between each variable classification as the testing of difference between small and large firms for size effect monthly. Also, the testing of difference of the individual variable value which is classified into growth and value firms. Finally, the testing of difference of the individual variable momentum which is classified into winner and loser firms.

Table (3) summarizes the testing of difference of the individual variables: size, value, momentum effects by months. Form table (3), one can indicate that:

1. There is no statistically significant difference between large and small firms according to the average size in case of monthly calculation of return where p-value = 0.372.
2. There is statistically significant difference between growth and value firms according to the average value in case of monthly calculation of return where p-value = 0.029 which is significance at 5 % level of significance.
3. There is statistically significant difference between winner and loser firms according to the average momentum in case of monthly calculation of return where p-value = 0.000 which is significance at 1 % level of significance.

Table (3): Testing of difference for size, value, and momentum factors

Variable	Average size effect (Small & Large)		
	Mean difference (%)	t-statistics	p-value
Average size effect (Small & Large)	-0.039	-0.894	0.372
Average value effect (Growth & Value)	-0.159**	-2.201	0.029
Average momentum effect (Winner & loser)	-0.247***	-17.037	0.000

*** indicate significance at 1 %, ** indicate significance at 5 %

Conclusion and Recommendation

According to the methodology of this study and from the results obtained in table (1) of the monthly descriptive statistics of size, value, and momentum effects from January 2004 to February 2015 and the results in table (3) of testing of difference for size, value, and momentum factors, we can present the following results for the three main factors of market anomalies (size, value, and momentum) and this impact on investment decision.

First: Size Effect:

From table (3), the testing hypothesis for the difference between average monthly return of small and large firms portfolio based on CAP is insignificant, i.e. there is no difference between large and small firms according to CAP return on the portfolio. Also, from table (1), the size effect is not clear which mean that the change in returns in Egyptian stock market can't be explained by size effect.

Thus the change in returns in Egyptian stock market can't be explained by the first factor of anomalies "size effect" and hence can't impact the investment decision during the period from 2004 to 2015.

Second: Value Effect:

From table (3), testing hypothesis for the difference between average monthly return of growth and value firms portfolio based on B/M ratio is significance, i.e. there is difference between growth and value firms according to return on the portfolio. Although, the difference is significant, the value effect is not clear from table (1) which mean that the change in returns in Egyptian stock market can't be explained by size effect.

Thus the change in returns in Egyptian stock market can't be explained by the second factor of anomalies "value effect" and hence can impact the investment decision during the period from 2004 to 2015.

Third: Momentum Effect:

From table (3), testing hypothesis for the difference between average monthly return of the portfolio loser and winner is significant, i.e. there is difference between loser and winner. Also, from table (1), the momentum effect is positive which mean that the change in returns in Egyptian stock market can be explained by momentum effect.

Thus the change in returns in Egyptian stock market can be explained by the third factor of anomalies "momentum effect" and hence can impact the investment decision during the period from 2004 to 2015.

Recommendation

We recommend that the study of impact of market anomalies on investment decision must be extended to investigate and analysis the following points:

1. Study of the impact of anomalies on the investment decision based on some sectors in the Egyptian stock market such as: industrial, banks, telecommunications, real stats, … etc.

2. Study of the impact of anomalies on the investment decision in the Egyptian stock market during the period from 2005 to 2020. One can divide the period from 2005 to 2020 into three main periods; from 2005 to 2010, from 2011 to 2015 and finally from 2016 to 2020.

3. Study of the impact of anomalies on the investment decision in the current period of COVID 19 and its changes on the Egyptian stock market.

References

1) Amihud, Y and Mendelson, H. (1991). Liquidity, assets prices and financial policy. Financial Analyst Journal, (47): 56-66.

2) Arbel, A. and Strebel, P. (1982). The Neglected and Small Firm Effects. Financial Review, 17, 201-218.

3) Banz, R. (1981). The relationship between return and market value of common stocks. Journal of Financial Economics, 9, 3-18.

4) Basu, S. (1977). Investment performance of common stocks in relation to their price earnings ratios: A test of the efficient market hypothesis. Journal of Finance, 12, 129–56.

5) Berk, J., 1995. A critique of size related anomalies. Review of Finance Studies, 8, 275–286.

6) Chan, L.K.C., Hamao, Y. and Lakonishok, J. (1991). Fundamentals and stock returns in Japan. Journal of Finance, 46, 1739–789.

7) Daniel, K., Hirshleifer, D. and Subrahmanyam, A. (1998). Investor psychology and security market under-and overreactions. Journal of Finance, 53, 1839-188.

8) Davis, S.P., Shanken, J. and Sloan, R.G. 1994. Another look at the cross-section of expected stock returns. Journal of Finance, 50, 185–224.

9) De Bondt, W., and Thaler. R. (1985). Does the stock market overreact? The Journal of Finance, 40, 793-805.

10) Edmister, J. (1983). The Relation between Common Stock Returns, Trading Activity and Market Value. Journal of Finance, 38, 1075–1086.

11) Fama, E. (1965). The Behavior of Stock Market Prices, Journal of Business, 38, 35–105.

12) Fama, E. (2014). Permanent and temporary components of stock prices. Journal of Political Economy, 96, 246–73.

13) Fama, E. F. and French, K. R. (1992). The Cross-Section of Expected Stock Returns. Journal of Finance, 47, 427–65.

14) Fama, E. F. and French, K. R. (1993). Common Risk Factors in the Returns on Stocks and Bonds. Journal of Financial Economics, 33, 3–56.

15) French. K. (2015). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. Review of Economics and Statistics, 17, 13-37.

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

17) Keim, B. (1983). Size related anomalies and stock returns seasonality. Journal of Financial Economics, 12,13-22.

18) Knez, P.J., and Ready, M.J. (1997). On the robustness of size and book-to-market in cross-sectional regressions. Journal of Finance, 4, 1355–1381.

19) Lee, W., Jiang, C. and Indro, D. (2002). Stock market volatility, excess returns, and the role of investor sentiment. Journal of Banking & Finance, 26, 2277-2299.

20) Reinganum, M. (1981). The anomalous stock market behavior of small firm un January: Empirical tests for tax-loss selling effects. Journal of Financial Economics, 12, 89-104.

21) Roll, R. (1981). A Possible Explanation of the Small Firm Effect. Journal of Finance, 36, 879-888.

22) Rosenberg, B., Reid, K. and Lanstein, R. (1985). Persuasive evidence of market inefficiency. Journal of Portfolio Management, Spring, 11, 9–17.

23) Schwert, G.W. (1978). Anomalies and market efficiency, In G. Constantinides, M. Harris, and R. Stulz (Eds.). Handbook of the economics.

24) Stattman, D. (1980). Book values and stock returns. The Chicago MBA: A Journal of Selected Papers, 4, 25–45.