The Long-run Abnormal Performance of Jordanian Initial Public Offerings (IPOs) listed in Amman Stock Exchange During The period (1993-2011)

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Abstract

This study aims at verifying the long-run abnormal performance for the Jordanian initial public offerings (IPOs) listed in Amman stock exchange during the period from (1st January,1993 until 31st December, 2011). In order to achieve the study objectives, the researchers applied the most common approach in the previous literature which is called "The Event Study" on the study sample which consisted of all the Jordanian initial public offerings that are listed in Amman stock exchange during the study period, which were (119) companies .Then, the researchers calculated the monthly returns for these companies for 60 months (5years) after public offering.

In order to explore the long-run abnormal performance, the researchers applied three major aggregating models which are: Firstly, the cumulative abnormal returns (CAR). Secondly, the buy and hold abnormal returns (BHAR). Thirdly, the wealth relative model (WR). The researchers also chooses three major benchmarks which are: the general monthly index for Amman stock exchange weighted by market capitalization (ASEI), the matching firms (MF) for the Jordanian initial public offerings in terms of the (size, age, and sector) as much as possible, which also already exist in the market, and their stocks traded in the Amman stock exchange and the capital assets pricing model (CAPM).

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Received: 18/ 2 /2014. **Accepted: 2 /10/2014.**

The results of the analysis showed that the study corresponds to most of the previous studies with regard to the long-run underperformance phenomenon for the initial public offerings (IPOs), but the level of this underperformance was different based on the benchmark employed to measure the long-run performance. This conclusion was also found by the results of some previous studies.

while for testing whether there are statistically significant differences in the means with regard to the abnormal returns (AR), the cumulative abnormal returns (CAR), the buy and hold abnormal returns (BHAR) , and the wealth relative (WR), based on the benchmark which is applied in comparison and measurement, the study showed that there are statistically significant differences in the abnormal returns (AR) after applying the three benchmarks mentioned earlier by using the parametric " One Sample T-test". The study also showed that there are statistically significant differences in the wealth relative (WR) also after applying the three benchmarks , by using the "traditional T-test "and through the event window of (the end of the 1st,6th ,12th ,24th ,36th ,48th ,and 60th months) after going public .

As for the cumulative abnormal returns (CAR), and the buy and hold abnormal returns (BHAR) , the study proved that there statistically significant differences in the means with regard to both models, only when the Amman stock exchange general monthly index is applied as a one of the benchmarks that are applied in the study, by using the "traditional T-test" and the same event window.

On the other hand, these differences of the cumulative abnormal returns (CAR), the buy and hold abnormal returns (BHAR) are not statistically proved by using the matching firms (MF) and the capital assets pricing model (CAPM)as benchmarks by using the same T-test and the same event window that were used before .

Keywords: Initial public offerings (IPOs), long-run underperformance, Amman stock exchange(ASE), event study.

الأداء غير الطبيعي طويل الأجل للإكتتابات العامة الأولية المدرجة في سوق عمان المالي خلال المدة (1993-2011)

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ملخص

تهدف هذه الدراسة إلى التحقق من الأداء غير الطبيعي طويل الأجل للإصدارات (الاكتتابات) العامة الأولية الأردنية المدرجة في سوق عمان المالي خلال الفترة من 1 كانون ثاني 1993م إلى 31 كانون أول 2011م. ومن أجل تحقيق هدف الدراسة، قام الباحث بتبني النمط الأكثر شيوعا في الأدب السابق، وهو دراسة الحدث (Event Study) على عينة الدراسة والمؤلفة من جميع الاكتتابات العامة الأولية الأردنية المدرجة في سوق عمان المالي خلال فترة الدراسة وعددها 119 شركة، ومن ثم قام الباحث بتتبع واحتساب العوائد الشهرية لهذه الشركات لمدة 60 شهراً (5 سنوات) بعد الطرح العام. ومن أجل الكشف عن الأداء غير الطبيعي طويل الأجل، قام الباحث بتطبيق ثلاثة نماذج تجميعية رئيسية وهي: أولاً: العوائد غير الطبيعية المتراكمة، ثانياً: عوائد الاحتفاظ غير الطبيعية، ثالثاً: نموذج نسبة الثروة. كما قام الباحث باختيار ثلاثة مؤشرات رئيسية وهي: أولاً: المؤشر العام الشهري لسوق عمان المالي المرجح بالقيمة السوقية (ASEI)، ثانياً: الشركات المطابقة للاكتتابات العامة الأولية الأردنية من حيث الحجم والعمر والقطاع كل ما أمكن ذلك والمتداولة أسهمها أصلا في سوق الأسهم الأردني(MF)، ثالثاً: نموذج تسعير الأصول الرأسمالية (CAPM). أظهرت نتائج التحليل توافق الدراسة مع أغلب الدراسات السابقة فيما يخص ظاهرة الأداء المخفض طويل الأجل للاكتتابات العامة الأولية. إلا أن مستوى هذا الأداء المخفض كان مختلفا بناء على المؤشر المطبق لقياس الأداء طويل الأجل وهذا ما توصلت إليه أيضا نتائج بعض الدراسات السابقة.

أما بالنسبة لاختبار فيما إذا كان هنالك فروقات ذات دلالة إحصائية في العوائد غير الطبيعية، العوائد غير الطبيعية المتراكمة، عوائد الاحتفاظ غير الطبيعية، ونموذج نسبة الثروة بناء على المؤشر المطبق في عملية اختبار وقياس الأداء طويل الأجل للاكتتابات العامة الأولية الأردنية،

فقد أثبتت الدراسة معنوية فروقات العوائد غير الطبيعية بتطبيق المؤشرات الثلاثة، وذلك باستخدام اختبار (T-test) المعلمي للعينة الواحدة. كما أثبتت الدراسة معنوية فروقات نموذج نسبة الثروة بتطبيق المؤشرات الثلاثة أيضا باستخدام اختبار (T-test) التقليدي من خلال نافذة الحدث (نهاية الشهر: الأول، السادس، الثاني عشر، الرابع والعشرون، السادس والثلاثون، الثامن والأربعون، الستون. بعد الطرح العام). أما فيما يخص العوائد غير الطبيعية المتراكمة، وعوائد الاحتفاظ غير الطبيعية. فقد أثبتت الدراسة معنوية فروقاتها وذلك فقط عند اعتماد وتطبيق مؤشر السوق العام الشهري كأحد المؤشرات المستخدمة في الدراسة. وذلك أيضا باستخدام اختبار (T-test) التقليدي واستخدام نفس نافذة الحدث السابقة. من جهة أخرى فإن هذه الفروقات الخاصة بالعوائدغير الطبيعية المتراكمة وعوائد الاحتفاظ غير الطبيعية لم تكن ذات معنوية ولم تدعم إحصائياً باستخدام مؤشر (الشركات المطابقة)، ومؤشر (نموذج تسعير الأصول الرأسمالية) وذلك باستخدام نفس الاختبار ونفس نافذة الحدث السابقين.

الكلمات الدالة: الاكتتابات العامة الأولية الأردنية، الأداء المخفض طويل الأجل، دراسة الحدث، مؤشر سوق عمان المالي، نموذج تسعير الأصول الرأسمالية.

Introduction

When companies are in need of raising capital, they often decide to gain the capital through initial public offerings (IPOs). IPOs allow the company to gain the capital it needs by selling stocks to the public for the first time. The money gained through an IPO can be used by the company for future expansion, debt repayment, or simply as a working capital.

Most companies start out by raising equity capital from a small number of investors. If those investors wish to sell their stocks, and if a company needs additional equity capital at some point in the future, the firm generally finds it desirable to go public by selling stock to a large number of diversified investors. Once the stock is publicly traded, this enhanced liquidity and allows the company to raise capital on more favorable terms than if it has to compensate investors for the lack of liquidity associated with a privately – held company .

So, IPO is an effective mechanism for raising capital, particularly, in the emerging markets where there is a limited source of funds and no venture capitalists (Levis,1993).

There are several reasons why the long-run performance of initial public offerings is of interest. Firstly, from an investor's viewpoint, the existence of price patterns may present opportunities for active trading strategies to produce superior returns. Secondly, the finding of nonzero aftermarket performance calls into question the informational efficiency of the IPO market, it provides evidence of hypothesis that equity markets in general and the IPO market in particular are subject to fads that affect market prices. Thirdly, the volume of IPOs displays large variations over time. Fourthly, the cost of external equity capital for companies going public depends not only on the transaction costs incurred in going public, but also on the returns that investors receive in the aftermarket.

In Jordan, however, the IPO trend has been to generate funds for start-up companies which have no prior operation or track record through an offering of stock at a price of 1 JD par value per share, where the offering price is set based on a corporate valuation, current market conditions and pricing of comparable listed companies.

The performance of IPOs has three anomalies (1) hot issue market (Benninga et.al,2004) and (Ritter,1984). (2) underpricing (Leite,2004), (Burchardi,2001), and (Koop and Li, 2001). (3) Long-run–underperformance (Ritter, 1991).

The Problem Statement

This research is considered as a cross-sectional analysis study to measure the long-run abnormal price performance of Jordanian initial public offerings (IPOs) listed in Amman stock exchange (ASE) during the period (1993- 2011), by measuring and testing the long-run abnormal return (AR) under using more than one model and more than one benchmark.

In view of that, the main problem of this research is to observe if the abnormal returns will be different when we employ a variety of benchmarks by measuring and testing the long-run abnormal return for the IPOs firms listed in ASE using various models and benchmarks.

The Research Questions

The research will answer five main questions summarized below:

1. What is the level of long-run performance of IPOs in ASE?
2. Is the long-run abnormal return (AR) sensitive to the benchmark employed or, does the long-run abnormal return differ according to the benchmark employed?
3. Is the cumulative abnormal return (CAR) sensitive to the benchmark employed, or, does the cumulative abnormal return differ according to the benchmark employed?
4. Is the buy and hold abnormal return (BHAR) sensitive to the benchmark employed, or, does the buy and hold abnormal returns differ according to the benchmark employed?
5. Is the wealth relative (WR) sensitive to the benchmark employed, or, does the wealth relative differ according to the benchmark employed?

The Importance of research

The importance of this research comes from: Firstly, for investors, to make rational investment decisions according to the listed firms returns, in order to make the decisions of buying or selling shares. Secondly, for issuers, in their new equity offering opportunities and alternatives. Thirdly, this study presents through its findings and recommendations a useful information about the characteristics of IPO firms for people involved, in addition for Jordan security commission for the process of regulation and supervision on the IPO firms. Fourthly, gives additional and international evidence about the long-run performance of initial public offerings (IPOs).

Because this subject is important, several studies tackled this issue in different markets , and different countries , thus this study measuring the long-run performance of IPO of the firms listed in ASE during the period (1993- 2011) by following the IPO return from the (first day of trading) to 60 months (5 years) after listing, and for this reason, the researchers have established the study period since year 1993 to be able to follow the IPOs five years after listing and also because the data from the sources are available from this date.

The research objectives

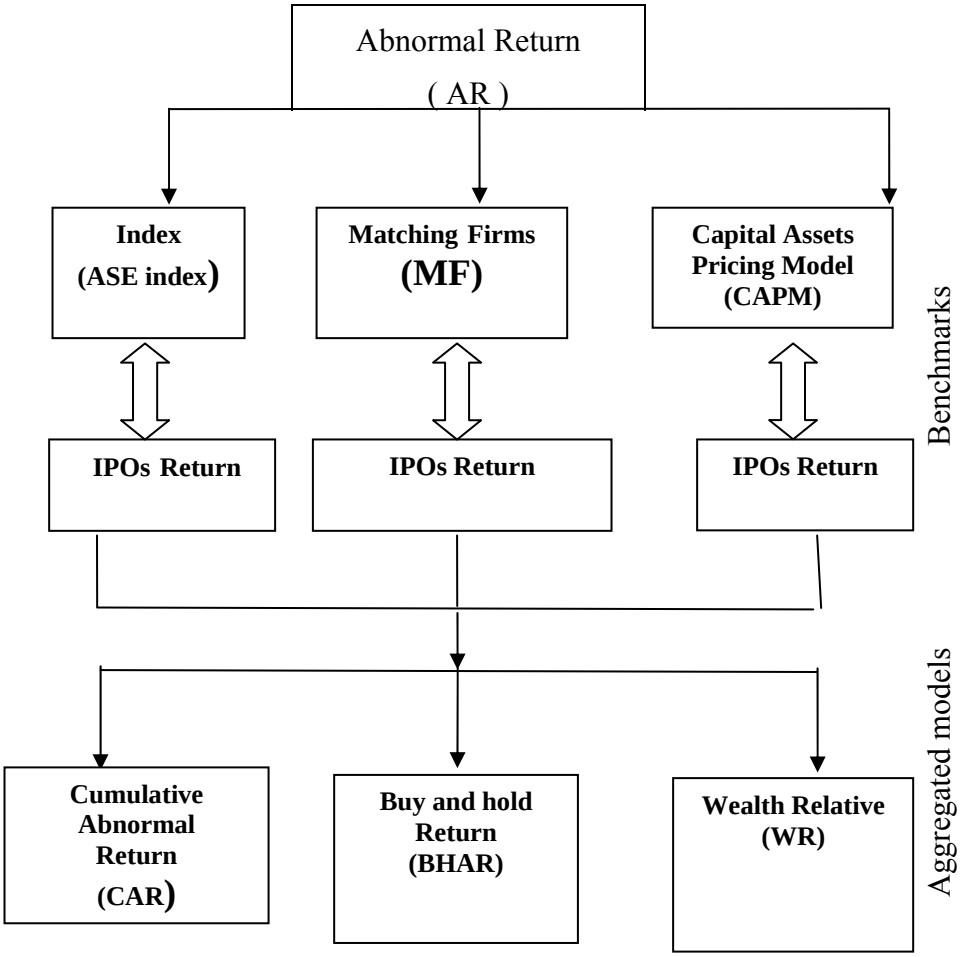
1. The main objective of this study is to find out how Jordanian IPOs performed in the long-run relative to employ certain benchmarks and using three main measures of performance in order to analyze the Jordanian IPOs long-run performance.

2. investigative the sensitivity of the benchmark employed to calculate the long-run abnormal return (AR), cumulative abnormal return (CAR), buy and hold abnormal return (BHAR), and wealth relative (WR).

Research diagram

The research diagram that summarizes the main element in this research is presented below in figure (1). This diagram gives the area of analysis based on the theoretical framework and literatu1re review.

Figure (1) Research diagram



Source: By the researchers

Literature review

There are several studies that examine the long-run performance of (IPOs) in different markets and different countries.

Ibbotson (1975) reported a negative relationship between initial return of the IPO and long-run share price performance for a sample of 220 US IPOs issued during 1960-1969. He reported that there was a general positive performance in the first year, negative performance in the next three years and a general positive performance in the fifth year.

Ritter (1991) analyzed the performance of 1,526 US IPOs issued between (1975-1984) and reported the underperformance of the benchmarks (NASDAQ ,AMEX , NYSE) about -27.39% in the three-year period after issuance. He also found that there are significant relationships between the age of the firms listed and their long-run performance.

In UK, Levis(1993) investigated the long-run performance of a sample consisting of 712 UK IPOs issued during the period (1980-1988). He reported that a long-run return is based on three alternative benchmarks : the financial time actuaries all share index (FTAI), the Hoar govett small companies index (HGSCI),and all share equally weighted index (ASEWI). His findings reported the long-run underperformance in the (UK) market between 8% to 23% depending on benchmark used . Levis also confirmed Ritter (1991) findings of statistically significant long-run IPOs underperformance. Espenlaub et al. (1998) reexamined the evidence of the long-run return of IPOs in UK over the period (1986-1991), by using a number of alternative benchmarks and documented that in the long-run the IPO firms underperform the market.

Loughran and Ritter (1995) investigate a sample of 4,753 US IPOs issued during (1970-1990), Loughran and Ritter reported that whether initial public offerings (IPOs) or seasoned equity offerings (SEOs) are significantly underperformed relative to non-issuing firms for five years after the offering date, the average annual return during the five years after issuing is only 5% for firms conducting IPOs, and only 7% for firms conducting SEOs.

Brav and Gompers (1997) report that venture capital – backed IPOs ; unlike other IPOs in the US ; do not significantly underperform over the long term relative to a style benchmark , suggesting that reputational concerns may constrain their actions. Reputational concerns may also be

responsible for the fact that potential conflicts of interest on the part of venture capitalists appear to play a little role in the pricing and performance of US IPO (Gompers and Lerner, 1999) .

Barber and Lyon (1997) analyzed 1,798 US IPOs issued during July 1963 to December 1994 using CAR and BHAR , Fama and French three - factor model. They reported three worthy results; firstly, cumulative abnormal return calculated using reference portfolios yield test statistics that are positively biased .The magnitude of the bias increases with the horizon of accumulation. This positive bias can be attributed to the positive mean abnormal return, which results from the new listing bias. Note that this positive bias is most pronounced when an equally weighted market index is used to calculate the CAR. Secondly, all of the control firm approaches yield well specified test statistics, the only exception for that is the size-matched control firm approach at the 5% significance level and 36 month. Finally, Barber and Lyon documented that Fama-French three factor model yields negatively biased test statistics at 12- and 36- month horizon.

Fama and French (1998) document that the long-term returns anomalies are fragile; they tend to disappear with reasonable changes in the way they are measured.

Carter and Singh (1998) investigated 2,292 US IPOs issued between January 1979 and December 1991.The result of this study is that over a three years period after IPO the US firms underperformed the market (NYSE, AMEX, and NASDAQ) by 19.92% and shows that low underwriter reputation had a strong negative effect on the long-run performance of IPO stocks.

Barber, Lyon and Tsai (1999) analyzed all NYSE/AMEX/NASDAQ firms during the period from July 1973 through December 1994. They analyzed various methods to test long-run abnormal stock returns and investigated misspecification. As a result, they documented that misspecification can be traced to (1) the new listing bias (2) the rebalancing bias (3) the skewness bias (4) cross sectional dependence and (5) bad model of asset pricing. How and whether these factors affect the misspecification of test statistics depend on the method used to calculate the abnormal returns.

Espenlaub et al. and Gregory (2000) investigate a sample consisting of 588 UK IPOs issued during the period form (1985-1992) using several benchmarks (CAPM, Value weighted multiple index , Fama and French model, size decile model) his results confirm the existence of statically and economically significant long-run IPOs under performance irrespective of the benchmark employed.

Mitchell and Stafford (2000) analyzed a sample consisting of major managerial decisions, precisely: mergers SEOs, share repurchases completed during the period (1958-1993). The sample consists of 4,911 underwritten primary and combination seasoned equity offerings (SEOs); 2,421 open market and tender-offer share repurchases and; 2,193 acquisitions of CRSP in the UK using BHAR model . They found that the popular approach of measuring long-term abnormal performance with mean BHARs in conjunction with bootstrapping is not an adequate methodology because it assumes independence of multi-year event firm abnormal returns. Also they showed that event firm abnormal returns are positively cross-correlated when overlapping in calendar time. As such assuming independence is problematic for any long term abnormal performance methodology. Moreover, this is likely to be a problem for most event samples, not just the mergers, SEOs, and share repurchases examined in this paper.

Hamao, packer, and Ritter (2000) examined a sample consisting of 355 Japanese IPOs issued during the period from April 1989 and December 1994. The three-year excess return was calculated as the three year buy and hold return for the IPO.Also; they used a wealth relative as a measure tool of performance. They found that the long-run performance of venture capital – baked IPOs was not better than that of other IPOs. Also they reported that Japanese IPOs underperformed over three years.

Gompers and Lerner (2001) investigated the performance for five years after listing using a sample consisting of 3,661 US IPOs issuing from 1935 to 1972. The sample displays some underperformance when event-time buy and hold abnormal returns are used to calculate abnormal return. The underperformance disappears when cumulative abnormal returns are utilized. A calendar time analysis shows that over the entire period, IPOs return as much as market. The intercepts in CAPM and Fama French regressions are insignificantly different from Zero, suggesting no abnormal performance.

Kooli and Suret (2004) investigated the long-run performance of 445 Canadian IPOs issued during the period (1991-1998). They found that investors who buy immediately after listing and who hold shares for five years will incur a loss of 24.66% on an equally weighted basis or 15.16% on a value weighted basis relative to an investment in the control firms. Also they found that IPOs underperformed over five years but the significant result varied according to the models used.

Saleh and Mashal (2008) examined a sample of IPOs firms listed in Amman Stock Market, they studied the sensitivity of the model used to estimate the cumulative average abnormal returns ; they employed three different models (CAPM , Fama and French there factor model , and multi-factor model), they used two approaches to test the result : standard event time analysis and the calendar time approach . The three models used to estimate the cumulative average abnormal returns produce significant negative abnormal returns. The main criticism of this study is using just Amman stock exchange (ASE) index as the main benchmark to estimate the long-run performance of IPOs.

Omran, (2005) documented that the underpricing of initial public offerings (IPOs) is found for 53 share issue privatizations in Egypt between 1994 and 1998. Over several intervals (up to five years), he finds mixed results: share issue privatizations sustain their positive performance and provide investors with positive abnormal returns over a one-year period; however, his results document negative abnormal returns over three- and five-year horizons

Ajlouni and Abu-Ein (2009) tested a sample of 24 IPOs companies listed in Amman Stock Exchange (ASE) during the period 1990-2006, the results show that Jordanian IPOs are significantly underperforming their benchmarks when performance is measured by both risk adjusted cumulative abnormal returns (CAR) and buy-and-hold returns (BHR), although BHR produced higher significance levels. In addition, sector analysis shows that IPOs of service companies performed better than those of industrial ones. However, both underperformed the market.

Braik (2010) investigated a sample consisting of 53 firms that went public in ASE over the period (1999-2008) using the general free float index (GFFI) , the sector free float index (SFFI) , and the value weighted index (VWI) as a benchmarks ; Braik found that the data support the fads

hypotheses . The study also suggests some evidence of the prospect of some operating determinants like, offer size, and SEOS to explain the Jordanian IPOS underperformance.

Gregory, Cuermat and Al-shawawreh (2010) examined 2,499 UK IPOs issued between mid-1975 and the end of 2004, they found compelling evidence of long-run underperformance that persists for between 36 and 60 months post flotation, depending on the precise method chosen to measure abnormal returns.

Wang , and Young (2010).Investigated the long-run performance of chine's IPOs by using 897 IPOs listed on the two Chinese stock Exchange during the period (1996-2002). Significantly positive abnormal returns are found up to three years after listing by using the cumulative abnormal returns measure (CAR),the buy and hold abnormal return measure (BHAR).

Sohn, Tsui, and Zhang (2012) investigated the performance of 230 Chinese IPOs issued in China during the period from January 1997 to December 1998.They found some evidence of undervaluation of IPOs by issuers and underwriters; but overvaluation of such IPOs by investors on the listing day. Also they reported a positive performance of IPOs after two years of issuance.

Agarwal (2012) examined the stock price reaction to announcement of 205 rights offers of equity in India made during the period from April 2000 to March 2011; the results of this study are consistent with those observed in developing countries which show that the abnormal returns observed around the announcement date hold a negative relationship with the decrease in leverage and the price discount offered in the rights issue.

Alanazi, Ahmed S. (2013), investigated the short- and long-run performance of 139 IPOs offered in six Arab Gulf countries between 2003 and 2010. Differing from other markets, the underpricing in the Arab Gulf countries is one of the largest in the world at 227.36 %. he examined the aftermarket performance of these IPOs. he finds that GCC IPOs perform poorly relative to the listing day closing price, over the course of one, two and three years of post-listing.

Research contribution

This study is considering the abnormal return in the long term by using several economic models, and it keeps track of abnormal return for the sample of the study up to 60 months after listing, the research shows that measuring the abnormal return in the long term will be subject to different statistical biases. It also discusses the most important statistical tests to clarify the strengths and weaknesses of each economic model employed to measure abnormal return in the long term.

Thus, this research contributes to the literature in different aspects: Mainly, the sample of this study is covering a wide range of period (1993-2011) for the IPO firms listed in ASE. Next, the method which is employed in this study, up to the knowledge of the researchers, hasn't been applied before in Jordanian studies, lastly, the data used in this study is comprehensive and covering all sectors in ASE. .

Research hypotheses

The hypotheses in this research are set to deal with the models and benchmarks used in this study and their impact on the measurement of abnormal return by examining if there is a differences in the abnormal returns (AR), cumulative abnormal returns (CAR), buy and hold abnormal return (BHAR), and wealth relative (WR) according to applying certain Benchmark. All of these hypotheses will be tested by using certain tests at the significant level of (5%), see table (1) which summarized the research hypotheses .

Table (1) Research Hypotheses

	Hypothesis		The Null Hypothesis
Benchmarks	**Benchmark number one: Amman Stock Exchange Index (ASEI)**		
	AR	H01	The long abnormal return is not significantly different from zero once applied (ASEI) as a benchmark
	CAR	H02	The long cumulative abnormal return is not significantly different from zero once applied (ASEI) as a benchmark.
	BHAR	H03	The long buy and hold abnormal return is not significantly different from zero once applied (ASEI) as a benchmark.
	WR	H04	There is no significant statistical difference in the wealth relative once applied (ASEI) as benchmark.
	Benchmark number two: Matching Firms (MF)		
	AR	H05	The long abnormal return is not significantly different from zero once applied (MF) as a benchmark.
	CAR	H06	The long cumulative abnormal return is not significantly different from zero once applied (MF) as a benchmark.
	BHAR	H07	The long buy and hold abnormal return is not significantly different from zero once applied (MF) as a benchmark.
	WR	H08	There is no significant statistical difference in the wealth relative once applied (MF) as benchmark.
	Benchmark number three: Capital Assets Pricing Model (CAPM)		
Benchmarks	AR	H09	The long abnormal return is not significantly different from zero once applied (CAPM) as a benchmark.
	CAR	H010	The long cumulative abnormal return is not significantly different from zero once applied (CAPM) as a benchmark. .
	BHAR	H011	The long buy and hold abnormal return is not significantly different from zero once applied (CAPM) as a benchmark.
	WR	H012	There is no significant statistical difference in the wealth relative once applied (CAPM) as benchmark.

Design and Methodology

The researchers described the appropriate research design and methodology in order to reach the objectives set. Following (Sekaran, 2007), the event study, descriptive, and hypotheses testing are chosen in this research. The descriptive study offers a view for relevant aspects of Jordanian IPOs market. As complement; hypotheses testing study offers an enhanced understanding of the relationships and affects that may exist between variables.

An event study methodology is chosen as a type of investigation in order to find an answer to the research questions and identify the important variables associated with the problem. The unit of analysis refers to the level at which data are aggregated (Sekaran, 2007). In this study the unit of analysis is represented by IPO firm. In terms of time horizon, this study is considered as a cross sectional study, (a study that can be done in which data are collected just once over a period of days, weeks, or months).at this point, in this research the data represented by the monthly return of IPO firms, index monthly returns, the matching firms monthly returns, and monthly returns calculated by using Capital Asset Pricing model during the study period.

Research Methodology

In this part, the researchers will describe the research population and sampling method and data collection method, describing benchmark and aggregated models which are employed in this research.

i. Research Population

In this research the population consists of 188 firms listed in ASE during the study period. But this number of firms does not only consist of the IPO firms. It includes IPOs firms plus firms that change their legal status from limited liability companies to public shareholder companies, which list their shares firstly and then execute a public offer plus the privatized firms which are three government firms that have been privatized through a public offering process during the research period.

ii. Sample of the study

The sample of the study consists of 119 IPOs. Issued between January (1993) to December (2011) in Amman stock exchange (ASE, 2011). Table (2) summarizes the final sample of the study after excluding the private offering and banks offerings, firms that change its legal status, and privatized firms.

Table (2)

Study Sample	
Total number of Jordanian IPOs in the raw sample during the research period	188
Less: Firms that change their legal status from limited liability companies to public shareholders companies	7
Less: privatized firms	3
Subtotal(1)	178
Less: private offering or right issues	59
Subtotal(2)	119
Final sample	119

iii. Data collection method

In this section, the researchers have collected the data from secondary sources. The raw data has been gathered from many sources such as Jordan Securities Commission (JSC) annual reports, and Amman Stock Exchange (ASE) annual reports, in addition to the data that have been gathered from Ministry of Finance and Central Bank, represented by the data which concerning the rate of return on treasury bills during the study period.

All the primary data needed to be addressed including the IPOs returns which are exist in Jordan securities commission (JSC) and Amman stock exchange (ASE) as a daily closing price. Besides the market returns which are represented by Amman stock exchange general weighted index which also exists as a daily closing prices. The researchers has converted all of these daily returns into monthly returns based on equation (14) to compute

the long-run return over the study period. Also the matching firms return which represents one of benchmarks that are employed in this study exists in (JSC) as a daily closing price and it also needs to be converted into the monthly returns in order to achieve research objectives.

iv. Benchmarks and aggregated model.

In this study, the researchers have employed three benchmarks; each one of these benchmarks will be compared with initial public offerings (IPOs) returns to compute the abnormal return (AR). Then the aggregated model will be computed for each comparison to see the degree of sensitivity of benchmark and aggregated models to the long-run abnormal returns.

The researchers chooses these benchmarks because they are appropriate and they have not been employed before in Jordanian market, beside that the data in which these bench marks needed, are available. Now let us discuss these benchmarks and aggregated models for more clarification.

Benchmarks

i. **Capital assets pricing model (CAPM) as follow:**

According to this benchmark the researchers will do some of the statistical calculations before employ this benchmark because of the nature of this benchmark which required that, so, the researchers will, Firstly ,Compute the IPOs firms' monthly return during the study period (R_{it}) . Secondly, compute the monthly risk free rate of return (R_{Ft}) represented by Treasury bill returns which existing in the ministry of finance and central bank based on the number of issues. Thirdly, compute the monthly value of (ß) because it is different from month to month depends on IPO return (R_{it}) , and market return (R_{mt}) .Fourthly, Compute the market monthly return during the study period (R_{mt}) ,represented by Amman stock exchange general index weighted by market capitalization Finally, the appropriate formula for calculating the abnormal return (AR) according to this benchmark will be as follow:

$$AR^{CAPM} = R_{it} - [R_{Ft} + \beta(R_{mt} - R_{Ft})] \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

(Alan Gregorg, Susanne Espenlaub, 2000)

Where:

R_{it}= is the return of company (IPOs) in event month t.

R_{mt}: **is the return of market in event month t. as measured by (ASE)index**

R_{Ft}: **is the treasury bill return in event month t**

β: **is the CAPM beta measured as:**

ii. **Matching firms (MF).**

According to this benchmark each of IPOs company matched with each company that already existing in the market and it has the same market capitalization (the same size) and it has the same age , or both of them belong to same sector, when this ever possible, so to employ this benchmark , the researchers, firstly, collects the firms already existing in the market which it's have the same size as the IPO company as possible ,especially if both of them have the same age and belong to the same sector and then the comparison will be made .Secondly, if the first condition has not been achieved, the comparison will be done between the IPO firms and the firms already existing in the market that animate the closest size and age of the IPO firms regardless of the sector. Finally,

The appropriate formula for calculating the abnormal return (AR) according to this benchmark will be as follow:

$$AR^{MF} = R_{it} - R_{MF} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (2)$$

(Ritter ,1991)

Where:

R_{it}: is the return of company i in event month t

R_{st}: is the return of size control portfolio in event month t, in this bench mark, the control portfolio return are equally weighted average return on a portfolio of all firm in the market capitalization decline to which firm i belongs in a given sample year.

iii. Amman Stock Exchange index (ASE index)

The third benchmark employed in this study is the Amman stock exchange index represented by the general index weighted by market capitalization. According to this benchmark, the comparisons will occur between the firms listed returns and (ASE) index itself. Finally, the appropriate formula for calculating the abnormal return (AR) according to this benchmark will be as follow:

$$AR^{ASEI} = R_{it} - R_{mt} \quad \text{...(3)}$$

The aggregating models

For any analysis of long-run returns, however, a model of expected return is most certainly required. The model which has been used most frequently in existing research on (IPOs) is the market adjusted return model. This model measures abnormal return in a particularly straight forward way as addressed below:

$$AR_{it} = r_{it} - r_{Bt}$$

The abnormal return is the raw return on the (IPOs) (r_{it}) minus the return on the benchmark (r_{Bt}) during a particular period.

Let's now explain and discuss these aggregated models. Note that these aggregated models will be employed in every comparison between the IPOs return and the benchmarks used for estimating abnormal return.

i. The Cumulative Abnormal Return (CAR):

Following Ritter (1991), a benchmark adjusted return for a given stock (i) in the event month (t) is calculated as the difference between the (IPOs) stocks raw return and the benchmarks raw return in month (t):

$$AR_{it} = r_{it} - r_{Bt} \quad \text{...(4)}$$

(Rritter, 1991)

Where

AR_{it}: is the abnormal rate of return for company (i) in month (t).

r_{it}: is the rate of return for company (i) in month (t).

r_{Bt}: is the rate of return of the benchmark during corresponding time period.

Also:

$$r_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \qquad (5)$$

Where:

r_{it}: is the rate of return for company (i) in the month (t) following listing.

P_{it}: is the closing price of company (i) in month (t)

P_{it}-1: is the closing price of company (i) in month (t-1)

Then:

$$AR_t = \frac{1}{n}\sum_{t=1}^{nt} AR_{it} \qquad (6)$$

Where

AR_t: is the equally weighted arithmetic average

n: is the number of (IPOs) companies in month (t)

Finally, the cumulative abnormal return is

$$CAR = \sum_{t=1}^{t} AR_t \qquad (7)$$

(Mario levis, 1993)

Where:

CAR: is the cumulative abnormal return from month (x) to month (y)

A positive CAR shows the overperformance of a portfolio of stocks against the benchmark.

ii. Buy and Hold Abnormal Return (BHAR)

Buy – and – hold return (BHR) rate of return for stock (i) is defined as the geometrically compounded return and it is calculated as follows:

$$BHR_{i,t} = \prod_{t}^{T}(1 + r_{it}) - 1 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

(Ritter, 1991)

Where

$r_{i,t}$: is the monthly return for company (i) in a month (t)

t: is the first month

T: is the end of the time window period

The benchmark adjusted buy and hold return (BHR): is the difference between the buy and hold return on a stock (IPOs) and the buy and hold return on its benchmark, and it is calculated as follows:

$$BHR_{i,t} = \left[\prod_{t}^{T}(1 + r_{it}) - 1\right] - \left[\prod_{t}^{T}(1 + r_{BM}) - 1\right] \ldots\ldots\ldots\ldots\ldots\ldots (9)$$

(Levis, 1993; Ritter, 1991)

Where:

r_{it}: is the monthly buy and hold return of a company (i), in event month (t).

r_{BM}: is the monthly buy and hold return for a benchmark in month (t).

If $BHAR > 0$, stock (i) is over performed the benchmark. A buy and hold strategy is clear when a company's stock is purchased at the first day of listing and held to the end of the period window.

The aggregated adjusted buy and hold abnormal return is calculated as the equally weighted average across a portfolio of (n) stock

$$\overline{BHAR}_{i,t} = \frac{1}{n}\left[\sum_{t-1}^{n}(BHAR_{i,t})\right] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (10)$$

iii. Wealth Relative (WR)

Wealth Relative (WR) is defined as the ratio of a stock's average return over a benchmark's average return during a period of (T) month calculated as follows

$$WR_{i,t} = \frac{1 + R_{i,t}}{1 + R_{BM,t}} \quad \ldots\ldots(11)$$

(Levis, 1993)

Where:

$R_{i,t}$: is the return of company (i), in event month (t).

$R_{BM,t}$: is the monthly return of benchmark, in event month (t).

The individual wealth relative is aggregated across the n stock to calculate the aggregate wealth relative, as follow:

$$WR_T = \sum_{t=1}^{n} WR_{i,t} \quad \ldots\ldots(12)$$

Then, the aggregated wealth relative, (WR_T) is calculated as the equally weighted average across a portfolio of (n) stock is:

$$\overline{WR}_T = \frac{1}{n}\left[\sum_{t=1}^{n} WR_{i,t}\right] \quad \ldots\ldots(13)$$

A wealth relative that is greater than 1.00 indicates that the portfolio of (n) stock's (IPOs) over preformed the benchmark.

1. Hypothesis testing procedures

i. Test of significance of abnormal return (AR)

After the abnormal return(AR)is calculated using (CAPM, MF, ASEI) as a benchmarks, the parametric "on sample t-test" is used to examine whether, or not, they obtained abnormal return mean (AR) is significantly different from zero at(α= 5%) (Testing the null Hypotheses H_{01}, H_{05}, H_{09}) as:

H_{01}: $AR_{sample,\ ASEI}=0$ against H_1: $AR_{sample,ASEI} \neq 0$

H_{05}: $AR_{sample,\ MF}=0$ against H_5: $AR_{sample,MF} \neq 0$

H_{09}: $AR_{sample,CAPM}=0$ against H_9: $AR_{sample,CAPM} \neq 0$

ii. Test of significance of cumulative abnormal return (CAR), buy and hold abnormal return (BHAR) and wealth relative (WR). (Testing the null hypotheses H_{02},H_{03}, H_{04}, H_{06}, H_{07}, H_{08}, H_{010}, H_{011}, H_{012}, at α= 5%)

After the cumulative abnormal return (CAR), buy and hold abnormal return (BHAR), and wealth relative (WR) are calculated using (ASEI.MF, CAPM) as a benchmarks, the conducted (conventional t-test) is used to test these hypotheses to determine whether, or not, there are differences in the means of (CAR, BHAR, WR) when employing certain benchmarks .the conventional T-test formula is addressed as follow:

$$tCAR_{it} = \frac{\overline{CAR}_{it}}{\sigma CAR_{it}/\sqrt{n}} \quad \text{..... (14)}$$

$$tBHAR_{it} = \frac{\overline{BHAR}_{it}}{\sigma BHAR_{it}/\sqrt{n}} \quad \text{..... (15)}$$

$$tWR_{it} = \frac{\overline{WR}_{it}}{\sigma WR_{it}/\sqrt{n}} \quad \text{..... (16)}$$

(Barber and Lyon, 1999))

Where:

$tCAR_{it}$: test the hypothesis that the monthly mean of cumulative abnormal return is equal to zero.

$tBHAR_{it}$: test the hypothesis that the monthly mean of buy and hold abnormal return is equal to zero.

tWR_{it}: test the hypothesis that the monthly mean of Wealth relative is equal to zero.

$\overline{CAR}_{it}$: is the sample average CAR.

$\overline{BHAR}_{it}$: is the sample average BHAR.

$\overline{WR}_{it}$: is the sample average WR

σCAR_{it}: is the cross sectional standard deviations of cumulative abnormal return for the sample of (n) firms.

$\sigma BHAR_{it}$: is the cross sectional standard deviation of buy and hold abnormal return for the sample of (n) firms.

σWR_{it}: is the cross sectional standard deviation of Wealth relative for the sample of (n) firms.

n: is the sample size (number of IPOs)

For test the hypotheses:

H_{02}: $CAR_{sample,\ ASEI}=0$	against	$H_{2:}\ CAR_{sample,\ ASEI} \neq 0$.
H_{03}: $BHAR_{sample,\ ASEI}=0$	against	H_3:$BHAR_{sample,\ ASEI} \neq 0$
H_{04}: $WR_{sample,\ ASEI}=0$	against	$H_{4:}WR_{sample,\ ASEI} \neq 0$
H_{06}: $CAR_{sample,\ MF}=0$	against	$H_{6:}CAR_{sample,MF} \neq 0$
H_{07}: $BHAR_{sample,\ MF}=0$	against	$H_{7:}BHAR_{sample,MF} \neq 0$
H_{08}: $WR_{sample,\ MF}=0$	against	$H_{8:}WR_{sample,MF} \neq 0$
H_{010}: $CAR_{sample,\ CAPM}=0$	against	$H_{10:}CAR_{sample,\ CAPM} \neq 0$
H_{011}: $BHAR_{sample,\ CAPM}=0$	against	$H_{11:}BHAR_{sample,\ CAPM} \neq 0$
H_{012}: $WR_{sample,\ CAPM}=0$	against	$H_{12:}\ WR_{sample,\ CAPM} \neq 0$

Empirical Results and Analysis

The methodology described in the previous chapter is applied in this one. The Jordanian IPOs monthly returns are calculated. Also each bench mark (Index, MF, CAPM) monthly returns are calculated to make the comparison and calculate (AR, CAR, BHAR, WR) for the Jordanian Initial Public Offerings (IPOs) based on each benchmark. So the discussion will be based on each benchmark results, to analyze the long-run performance of Jordanian initial public offerings.

Descriptive statistics For (AR, CAR, BHAR, WR)

Before we start the analysis of long-run performance of Jordanian initial public offering, we should review some of the descriptive statistical for (AR, CAR, BHAR, WR) among three benchmarks employed in this study, see table (3) which reviews these descriptive statistics for the study sample which consist of (119) Firms, for an entire period of sixty months (Five Years) after going public.

Table (3) Descriptive statistics of long term Jordanian IPOs returns

	N	Minimum	Maximum	Mean	Median	Std.Dev
Panel (A): ASEI (Benchmark number one)						
AR	60	-0.0262	0.0211	0.01258	0.0010	0.0063
CAR	60	-0.6620	0.0413	-0.0203	-0.0149	0.0463
BHAR	60	-0.3400	-0.0100	-0.0241	-0.0112	0.0895
WR	60	0.5702	1.0214	0.9621	0.9501	2.7500
Panel (B): MF (Benchmark number Two)						
AR	60	-0.0361	0.0032	0.00348	0.0192	0.0064
CAR	60	-.2060	0.0033	-0.0259	-0.0248	0.6822
BHAR	60	-0.4801	-0.0050	-0.0686	-0.0674	0.6128
WR	60	0.8781	1.3682	0.9422	0.9398	2.6311
Panel (B): CAPM (Benchmark number Three)						
AR	60	-0.0600	0.0031	0.0055	0.0043	0.0127
CAR	60	-0.3130	0.0050	-0.0280	-0.0211	0.1981
BHAR	60	-0.2250	-0.0140	-0.0947	0.0918	0.7580
WR	60	0.7204	1.040	0.9540	0.9500	3.300

Source: prepared by the researchers

Long-run performance of Jordanian initial public offering

As we mentioned at the beginning of this chapter, the analysis of long-run performance of Jordanian (IPOs) will be based on each employed benchmark results to explain and describe the performance of Jordanian (IPOs) in the long term for more understanding and clarification.

i. Benchmark: Amman stock Exchange Index (ASEI)

The researchers calculates (AR, CAR, BHAR, WR) that are related to using this benchmark. See table (4) which shed light on these values during particular windows of time, and figures (4, 5, 6, 7) which show the movement of the values of (AR, CAR, BHAR, WR) among the entire period using (ASEI) as the first benchmark.

Table (4) (AR, CAR, BHAR, WR) Using (ASEI) as a benchmark

Month of intervals	AR%	CAR%	BHAR%	WR%
0.994	-0.292	0.024	-0.008	6
0.760	-0.275	-0.036	-0.007	12
24	-0.023	-0.180	-0.035	0.978
36	-0.019	-0.310	-0.045	0.984
48	-0.019	-0.478	-0.031	0.600
60	-0.013	-0.662	-0.340	0.820

Source: prepared by the researchers

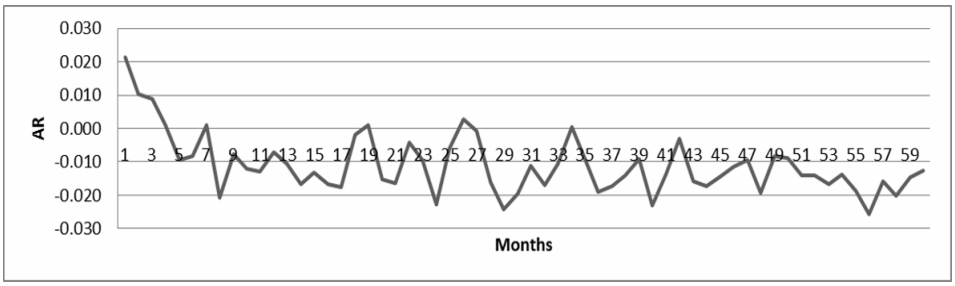


Figure (4): Abnormal Return (AR) Using (ASEI) as a benchmark

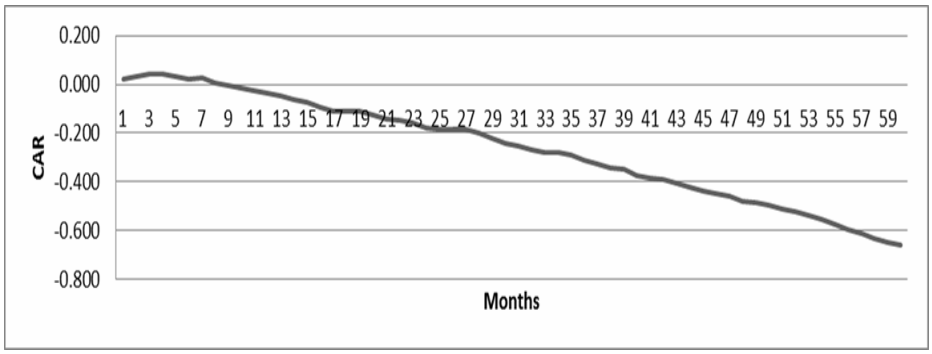
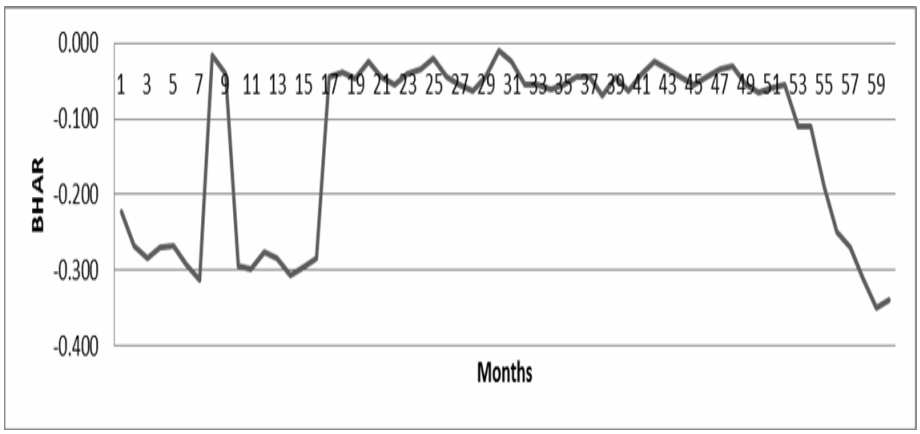


Figure (5) Cumulative Abnormal Return (CAR) Using (ASEI) as a benchmark



Figure(6) :Buy and Hold Abnormal Return (BHAR) Using (ASEI) as a benchmark

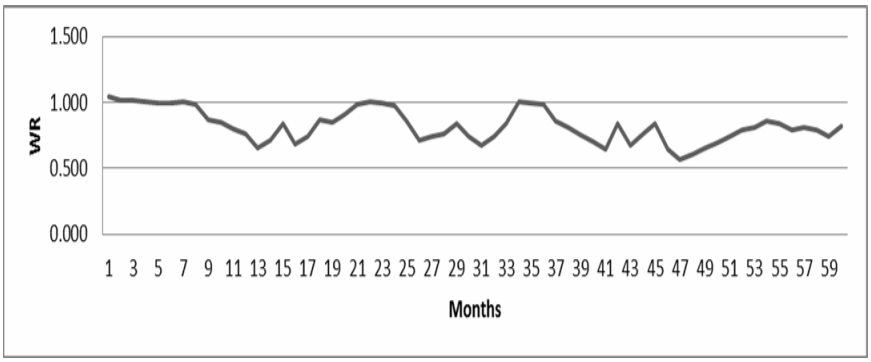


Figure (7) Wealth Relative (WR) Using (ASEI) as a benchmark

Using this benchmark, the Jordanian IPOs produce a positive initial returns for the first eight months after going public depending on the value of cumulative abnormal return of (0.021, 0.031, 0.040, 0.041, 0.033, 0.024, 0.025, 0.004) respectively. This result of positive initial returns was reported by (Ibbotson, 1975) and (Ritter, 1991) and champing and young, 2010) and a number of previous studies.

From the table(4) and the figures (4,5,6,7) above it appears that after six months of trading the cumulative abnormal return (CAR) was (2.4%) which means that the Jordanian (IPOs) over performed the market by about (2.4%), the level of underperformance at the end of first year after going public was (-3.6%) increasing at the end of second year up to (-18%), continues increasing at the end of third year, fourth year, fifth year up to (-31%), (-47.8%), (-66.2%) respectively, means that the Jordanian IPOs, using this benchmark and after five year of going public, underperformed against the market by about -66.2% CAR.

On the other hand the buy and hold abnormal return (BHAR) produced a negative abnormal return after the first month of trading with (-22.2%),. The level of underperformance increased up to(-29.2%) at the end of the sixth month after going public, the values of buy and hold abnormal returns decrease at the end of first year, second year after trading of (-27.5%), (-3.5%), respectively, and rise again at the end of the third year of (-4.5%),

decreasing at the end of fourth year of (-3.1%). Finally, at the end of the fifth year after going public the level of underperformance of Jordanian (IPOs) rises up to (-34%).Which means that, the Jordanian IPOs ,using this benchmark , and after five year of going public ,underperformed against the market by about -34% BHAR.

Whereas the wealth relative (WR) according to this benchmark performed over the market after the first forth months after the issuance of (1.040, 1.018, 1.011, 1.00) respectively. The level of underperformance begin at the end of fifth month after trading of (0.993) which closes to (1.000), meaning that no return was recorded either positive or negative. Also, the value of wealth relative at the end of sixth month was (0.99).

The level of underperformance appears clearly at the end of the first year of trading which increased up to (76%), decreasing at the end of the second year, and the third year of (97.8%, 98.4%) respectively, the level of underperformance increased at the end of fourth year after trading up to (60%), and decreased at the end of fifth year up to (82%);which means that, the Jordanian IPOs, using this benchmark, and after five year of going public, underperformed against the market by about 82% WR.

In total we can say "using this benchmark, and after five years of going public, the Jordanian IPOs underperformance against the market index by about (-66.2%, CAR, -34% BHAR, and 82% WR). This result gives another evidence of long-run underperformance of IPO phenomenon documented by (Ritter 1991), (Levis, 1993),(Espenlaub and Gregory ,2000),(Loughran and Ritter 1996) and many literature investigating the long-run performance of IPOs .

ii. Benchmark: Matching Firms (MF)

After calculating the monthly return for the matching firms during the study period, the researchers calculate (AR, CAR, BHAR, WR) for this benchmark, see table (5) which shed light on these values after six months, one year, two years, three years, four years, and five years after going public, and figures (8, 9, 10, 11) which show the movement of the values of (AR, CAR, BHAR, WR) among the entire period using (MF) as the second benchmark.

Table (5) (AR, CAR, BHAR, WR) Using (MF) as a benchmark

Month of intervals	AR%	CAR%	BHAR%	WR%
6	-0.001	-0.027	-0.047	0.992
12	-0.001	-0.034	-0.056	0.998
24	-0.002	-0.054	-0.064	0.880
36	-0.002	-0.114	-0.758	0.810
48	-0.002	-0.177	-0.399	0.810
60	-0.004	-0.206	-0.480	0.940

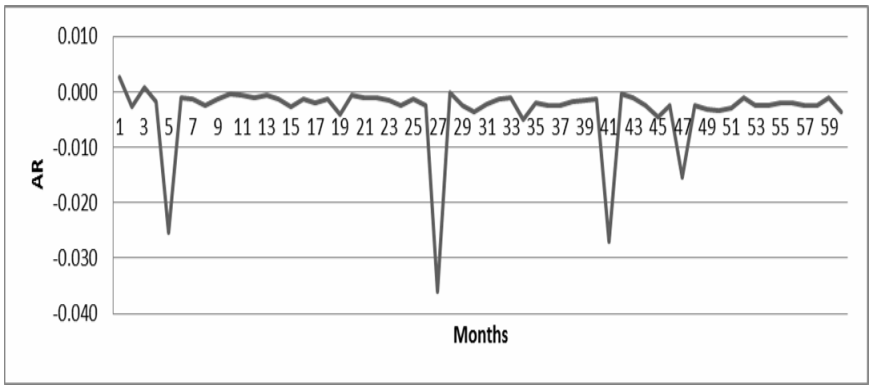


Figure (8) Abnormal Return (AR) Using (MF) as a benchmark

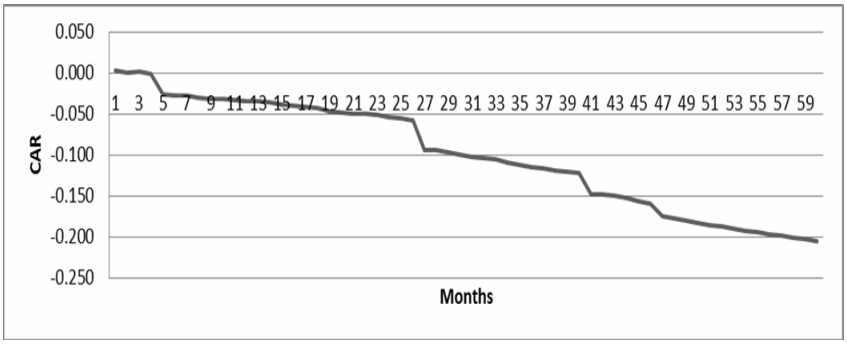


Figure (9) Cumulative Abnormal Return (CAR) Using (MF) as a benchmark

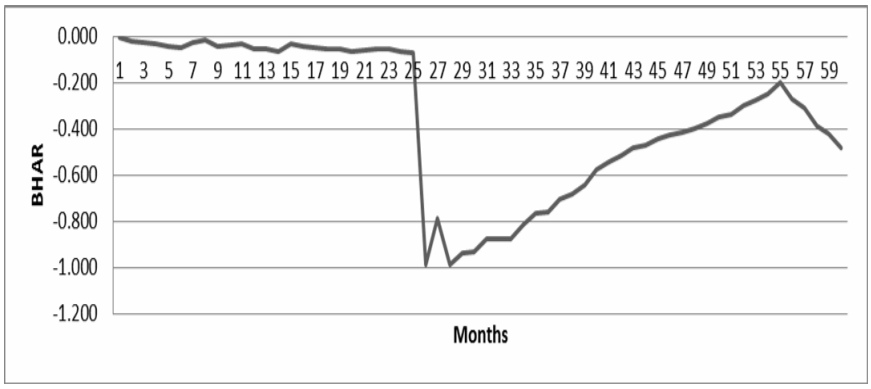


Figure (10) :Buy and Hold Abnormal Return (BHAR) Using (MF) as a benchmark

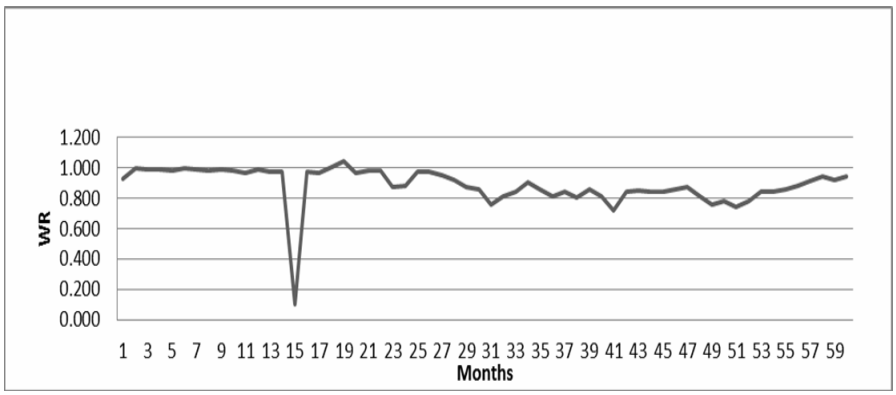


Figure (11): Wealth Relative (WR) Using (MF) as a benchmark

From the table (5) and figures (8, 9, 10, 11) above, it appears that after six months of trading the cumulative abnormal return (CAR) was (-2.7%), jumped to (-3.4%) at the end of first year of trading, the level of underperformance increased up to (-5.4%, -11.4%, -17.7) respectively, at the end of the second, third and fourth year. Finally, the level of underperformance of Jordanian IPOs, using this benchmark, increased up to (-20.6%) at the end of the fifth year of trading, or going public.

Whereas the value of buy and hold abnormal return (BHAR) after 6 months of trading was (-4.7%), increasing to (-5.6%) at the end of the first year of trading. The level of underperformance increased again to (-6.4%, -75.8%) at the end of the second year, and third year respectively. At the end of the fourth year the level of underperformance Jordanian IPOs decreased to (-39.9%) and increased to (-48%) at the end of the fifth year after going public.

On the other hand, the value of wealth relative after six months of trading was (0.992). The level of underperformance of Jordanian IPOs increased to (0.988, 0.880, 0.180, 0.810) after the first year, second year, third year, and fourth year respectively, decreasing up to (0.940) at the end of the fifth year after going public.

In total, we can say that "using this benchmark and after five year of going public the Jordanian (IPOs) underperformed against the matching firms by about (-20.6% CAR, -48% BHAR, 94% WR).This, also gives another evidence of the long-run IPOs underperformance reported by the previous studies.

iii. Benchmark: Capital Asset Pricing Model (CAPM)

The last benchmark employed in this study to measure the long-run performance of Jordanian (IPOs) is the Capital Assets Pricing model (CAPM). See table (6) which document the results and values of (AR, CAR, BHAR, WR) among particular windows of time using this benchmark, and figures (12, 13, 14, and 15) which exhibit the movement of the values of (AR, CAR, BHAR, WR) among the entire period using (MF) as the third benchmark employed in the study.

Table (6) (AR, CAR, BHAR, WR) Using (CAPM) as a benchmark

Month of intervals	AR%	CAR%	BHAR%	WR%
6	-0.002	-0.059	-0.041	0.984
12	-0.001	-0.069	-0.047	0.983
24	-0.004	-0.091	-0.054	0.967
36	0.001	-0.120	-0.054	0.860
48	-0.001	-0.145	-0.065	0.820
60	-0.002	-0.313	-0.225	0.760

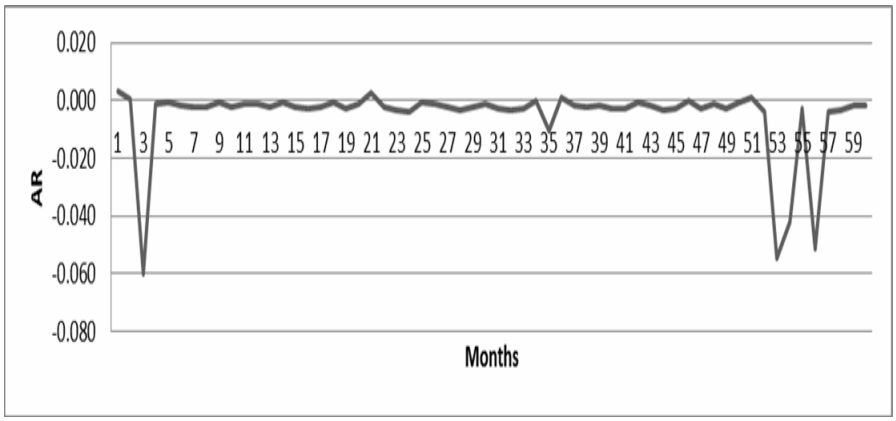


Figure (12) : Abnormal Return (AR) Using (CAPM) as a benchmark

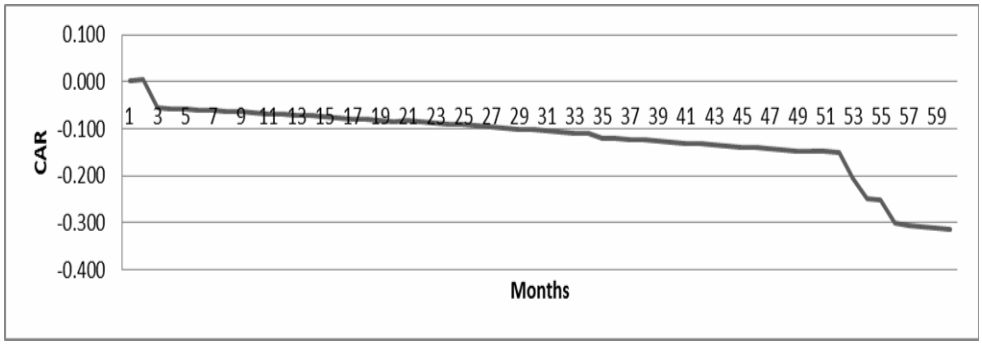


Figure (13) : Cumulative Abnormal Return (CAR) Using (CAPM) as a benchmark

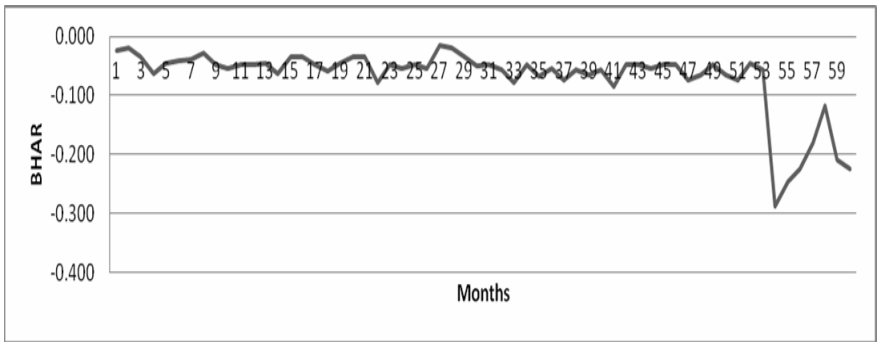


Figure (14) : Buy and Hold Abnormal Return (BHAR) Using (CAPM) as a benchmark

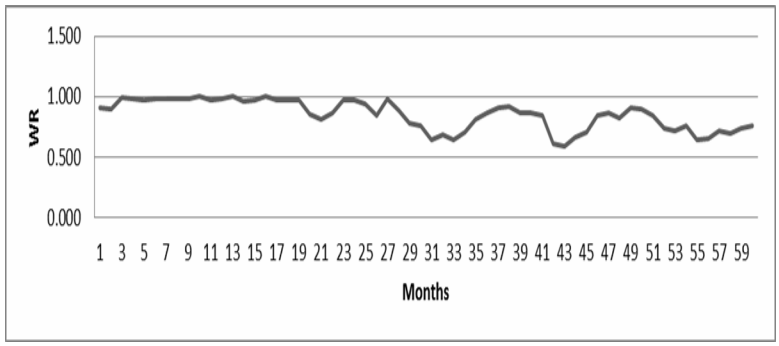


Figure (15): Wealth Relative (WR) Using (CAPM) as a benchmark

Form the table (6) and Figures(12,13,14,15) above, the Jordanian (IPOs) after six months of going public underperformed against this benchmark by about (-5.9%) which represent the value of cumulative abnormal return after six months of trading. The level of underperformance increased at the end of the first year, second year, and third year up to (-6.9%, -9.1%, -12%) respectively and rose again at the end of the period up to (-14.5%, -31.3%) at the end of the fourth year, fifth year respectively.

The buy and hold abnormal return (BHAR) produce a negative abnormal return after the first month of trading with (-2.4%) . The level of underperformance increased up to (-4.1%, -4.7%, -5.4%) at the end of six months, first year, second year respectively. The level of underperformance of Jordanian IPOs stayed at (-5.4%) at the end of the third year after trading. Increasing at the end of the forth year, fifth year, by about (-6.5%, -22.5%) respectively.

Whereas the wealth relative values after the six months, the first year, and the second year (98.4%, 98.3%, 96.7%) which are considered as an evidence of underperformance (less than 1). The level of underperformance increased up to (86%, 82%, 76%) respectively, at the end of the third year, fourth year, and fifth year.

In total we can say that " the Jordanian (IPOs) using this benchmark, and after five year of going public, underperformed against this benchmark by about (-31.3% CAR, -22.5% BHAR, 78% WR).

Parametric T-test

It is worth to mention that in the parametric T-test, the null hypothesis which is , no difference in the abnormal return (AR) is tested by means of whether or not the average (AR) is significantly different from zero, (Erikson and Moller, 2008).

One sample T-test

In this study, the researchers used the one sample T-test to determine whether if there is a difference in the abnormal return (AR) among three benchmarks that are used in this study (test the null hypothesis H_{01}, H_{05}, H_{09}), see table (7) which summarized the one sample T-test resulted for abnormal return (AR) among three benchmark employed.

Table (7) One sample statistics and T-test for the (AR) Using different benchmark

AR	N	Mean	Std.dev	df	t-statistic	
					Value	probability
	60	0.01258	0.006384	59	15.268	0.0000***
Panel (A): AR using ASEI as a benchmark						
AR	N	Mean	Std.dev	df	t-statistic	
					Value	probability
	60	0.00348	0.006400	59	4.216	0.0000***
Panel (A): AR using ASEI as a benchmark						
AR	N	Mean	Std.dev	df	t-statistic	
					Value	Probability
	60	0.00550	0.012717	59	3.342	0.0000***

***** stands for statistical significance at the1 percent level**

Panel (A) from table (7) reveals that the mean for abnormal return (AR) once employed Amman stock Exchange Index as the first benchmark is different from zero (0.01258) .This difference is proved statistically for abnormal return which has a P-value of (0.0000), therefore at (5%) level of significance; the null hypothesis about the difference of sample mean from zero is rejected due to P-value which is less than (5%) and the difference is significant. Hence, the null hypothesis (H_{01}) is rejected.

On the other hand as displayed in panel (B) it appears that the mean for abnormal return (AR) once employed the matching firms (MF) as a second benchmark is different from zero (0.00348). Actually, this difference is proved statistically for abnormal return which has a p-value of (0.0000) therefore at a (5%) level of significance; the null hypothesis about the difference of sample mean from zero is rejected due to p-value which is less than (5%) and the difference is significant. Hence, the null hypothesis (H_{05}) is rejected.

Finally, the panel (C) from the same table reveals that the mean for abnormal return (AR) once employed the capital assets pricing model (CAPM) as the third and last benchmark is different from zero (0.00550). Also, this difference is proved statically for abnormal return which has a p-value of (0.0000), therefore at (5%) level of significance; the null hypothesis about the difference of sample mean from zero is rejected due to p-value which is less than (5%) and the difference is significant. Hence, the null hypothesis (H_{09}) is rejected.

2. Analysis of long-run performance

In this section, with the aim of applying methodology outlined in the previous chapter, the researchers analyzed the Jordanian (IPOs) long-run performance based on cumulative abnormal return (CAR), buy and hold abnormal return (BHAR), and wealth relative (WR); the methodology supported by (Barber and Lyon, 1997) issued, instead of (CAR, BHAR, WR) and its calculation results in a seven different event windows after going public, and using a conventional T-test to determine whether, or not ,there are differences in the cumulative abnormal return (CAR) buy and hold abnormal return (BHAR), and wealth relative (WR), for using and applying each benchmark used in the study.

13.1 Test for significance of CAR, BHAR, and WR

To test the significance of (AR, BHAR, WR) and determine whether, or not, there are differences in the (CAR, BHAR, WR) among the benchmarks employed. The analysis should be also based on each benchmark result, for more understanding and hypothesis testing procedure.

i. Benchmark number one: Amman Stock Exchange Index (ASEI)

Table (8) below shows the analysis results for using Amman stock exchange index as the first benchmark employed in the study to test the hypothesis (H02, H03, H04) after calculating the conventional T-test and P-value, through different event windows

Table (8) :(CAR, BHAR, WR) Statistics and conventional T-test Using (ASEI) as benchmark and under different Event windows

Panel (A): Cumulative abnormal return (CAR)						
	N	**Event window**	**Mean**	**Std.Dev**	**t-statistic**	
					Value	**probability**
CAR	119	1	0.0205	0.0463	4.818	0.000***
	119	6	0.0396	0.0695	6.216	0.000***
	117	12	-0.0375	0.0601	-6.749	0.000***
	112	24	-0.0228	0.0725	-3.196	0.000***
	111	36	-0.0189	0.0624	-3.321	0.001***
	99	48	-0.0252	0.0502	-4.994	0.000***
	84	60	-0.0736	0.0972	-6.940	0.000***
Panel (B): Buy and Hold Abnormal Return (BHAR)						
	N	**Event window**	**Mean**	**Std.Dev**	**t-statistic**	
					Value	probability
BHAR	119	1	-0.0241	0.0895	-2.936	0.003***
	119	6	-0.0292	0.0694	-4.588	0.000***
	117	12	-0.0275	0.0726	-4.095	0.000***
	112	24	-0.0280	0.0641	-4.628	0.000***
	111	36	-0.0242	0.0412	-6.192	0.000***
	99	48	-0.0154	0.0251	-6.117	0.000***
	84	60	-0.0012	0.0051	-2.119	0.037**
Panel (C): wealth relative (WR)						
	N	**Event window**	**Mean**	**Std.Dev**	**t-statistic**	
					Value	**probability**
WR	119	1	1.021	2.771	4.020	0.000***
	119	6	0.994	3.086	3.514	0.000***
	117	12	0.995	4.003	2.689	0.008***
	112	24	0.978	2.884	3.588	0.000***
	111	36	0.984	2.610	3.973	0.000***
	99	48	0.984	1.861	5.259	0.000***
	84	60	0.987	1.953	4.630	0.000***

***, ** stands for statistical significance at the 1, 5 percent level respectively

Table (8) above sheds light on statistics and t-test for (CAR, BHAR, WR) in addition to P-value when employing (ASEI) as a first benchmark and through different event windows (month after going public) of (1, 6, 12, 24, 36, 48, 60) to test the hypotheses that determined, whether, or not, there are differences in cumulative abnormal return (CAR), buy and hold abnormal return (BHAR), and wealth relative (WR), when employing (ASEI) as bench mark (Barber and Lyon, 1997).

Panel (A) from table (16) reveals that the means for cumulative abnormal returns (CAR) during the event windows are different from zero (0.0205, 0.0396, -0.0375, -0.0228, -0.0189, -0.0252, -0.0736).

Those differences, actually are proved statistically according to p-value of (0.000, 0.000,0.000,0.000,0.000,0.000) respectively therefore at 5% level of significance; the null hypothesis about the difference of (CAR) using this benchmark (H02) is rejected due to p-values which are less than (5%) level of significance.

On the other hand, from penal (B) in the same table, it appears that the means of buy and hold abnormal returns (BHAR) are respectively different from zero of (-0.0241, -0.0292, -0.0275, -0.0280, -0.0242, -0.0154, -0.0012). Those differences, are also proved statistically through the p-values of (0.003, 0.000, 0.000, 0.000, 0.000, 0.000, 0.037) respectively.

so, at 5% level of significant, the null hypothesis about the differences of BHAR, using this benchmark (H03) is rejected, and the differences are significant, due to p- values which are less than 5% level of significance.

The reason behind the appearance of these differences in cumulative abnormal returns. (CAR), and buy and hold abnormal returns (BHAR), is the bench mark employed; which is the index, the index bias of the largest and biggest companies listed (Barber and Lyon and Tasia, 1999), this bias existing in the most indices in the word and for this reason the index is considered as a weak benchmark used for estimating the long-run performance of IPOs. In case of Jordan market there are many companies that could affect the index either up or down, such as Arab bank, Arabian Potash Company, Phosphate company, Jordan telecom company.

From panel (C) in the table (16) above , it seems that the means of wealth relative (WR) are respectively different from zero of (1.021, 0.994, 0.995, 0.978, 0.984, 0.984, 0.987).Those difference are proved statistically

according to p- values of (0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000), therefore, at 5% level of significance, the null hypothesis about the differences of wealth relative (WR) using this benchmark (H04) is rejected, and the differences are significant due to p- values which are less than 5% level of significance.

ii. Benchmark number two: Matching Firms (MF)

Table (9) below shows the empirical results for using matching firms as a second benchmark employed in the study to test hypothesis number (H_{06}, H_{07}, H_{08}), after calculating the conventional T-test, besides the p-values, under different event windows.

Table (9) CAR, BHAR, WR Statistics and conventional T-test Using (MF) as a bench mark and under different event widows

Panel (A) Cumulative Abnormal Return (CAR)						
	N	**Event window**	**Mean**	**Std.Dev**	**t-statistic**	
					Value	**probability**
CAR	119	1	0.0261	0.6858	0.415	0.678
	119	6	-0.0102	0.6750	-0.165	0.869
	117	12	-0.0140	0.9450	-0.160	0.873
	112	24	-0.0335	0.7026	-0.504	0.615
	111	36	-0.0337	0.5958	-0.597	0.551
	99	48	-0.0245	0.5887	-0.414	0.679
	84	60	-0.0362	0.4773	-0.696	0.488
Panel (B) Buy and Hold Abnormal Return (BHAR)						
	N	Event window	Mean	Std.Dev	t-statistic	
					Value	probability
BHAR	119	1	-0.0686	0.6128	-1.221	0.224
	119	6	-0.0604	0.4209	-1.566	0.120*
	117	12	-0.0446	0.2531	-1.906	0.059**
	112	24	-0.0620	0.5014	-1.308	0.194
	111	36	-0.0758	0.6132	-0.302	0.195
	99	48	-0.0399	0.3147	-1.263	0.209
	84	60	-0.0038	0.0551	-0.625	0.533

Panel (C) Wealth relative (WR)						
	N	Event window	Mean	Std.Dev	t-statistic	
					Value	probability
WR	119	1	1.028	3.388	3.309	0.000***
	119	6	0.992	3.487	3.105	0.000***
	117	12	0.988	4.699	2.274	0.000***
	112	24	0.969	3.597	2.855	0.000***
	111	36	0.969	2.947	3.464	0.000***
	99	48	0.978	2.991	3.253	0.000***
	84	60	0.965	2.348	3.768	0.000***

***, **,* stands for statistical significance at the 1,5 and 10 percent level respectively.

Panel (A) from table (9) reveals that the means of cumulative abnormal returns (CAR) during the event window are correspondingly different from zero (0.0261, -0.0102, -0.0140, -0.0335, -0.0337, -0.0245, -0.0362).In fact, those differences are not proved statistically according to p- values of (0.678, 0.869, 0.873, 0.615, 0.551, 0.679, 0.488) respectively. Therefore, at 5% level of significance; the null hypothesis about the difference of the means of CAR using this benchmark (H06) is accepted due to p-values which are more than 5%. Level of significance.

On the other hand as displayed in panel (B), it appears that the means for buy and hold abnormal returns (BAHR) are respectively different from zero (-0.0686, -0.0604, -0.0446, -0.0620, -0.0758, -0.0399, -0.0038). Also those differences are not proved statistically according to p- value of (0.224, 0.120, 0.059, 0.194, 0.195, 0.209, 0.533) respectively. Therefore, at 5% level of significance; the null hypothesis about the differences of the means of BHAR using this benchmark (H07) is accepted due to p- values which are more than 5% level of significance.

Whereas the panel (C) in the same table, illustrates that the means for wealth relative (WR) are respectively (1.028, 0.992, 0.988, 0.969, 0.969, 0.978, 0.965) which are different from zero. Those differences are proved statistically for wealth relative (WR); which have respectively a p- value of (0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000). Therefore, at 5% level of significance; the null hypothesis about the differences of the means of WR from zero; using this benchmark (H08) is rejected, due to t-statistics values and its p-values which are more than 5% level of significance.

iii. Benchmark number three: Capital Assets Pricing Model (CAPM)

Table (10) below summarized the empirical results for using capital assets pricing model (CAPM) as a third, and last benchmark employed in this study to test the hypothesis ($H0_{10}$, $H0_{11}$, $H0_{12}$) after calculating the conventional T-test and p- value under different event windows.

Table (10) : CAR, BHAR, WR, Statistics and conventional T-test using (CAPM) as a benchmark and under different event windows

Panel (A) Cumulative Abnormal Return (CAR)						
	N	**Event window**	**Mean**	**Std.Dev**	**t-statistic**	
					Value	**probability**
CAR	119	1	0.0290	0.1985	1.594	0.113*
	119	6	-0.0187	0.1090	-1.871	0.063**
	117	12	-0.0224	0.1501	-1.614	0.109*
	112	24	-0.0393	0.2110	-1.971	0.051**
	111	36	-0.0333	0.1990	-1.763	0.080**
	99	48	-0.0301	0.1900	-1.596	0.118*
	84	60	-0.0325	0.1950	-1.527	0.130*
Panel (B) Buy and Hold Abnormal Return (BHAR)						
	N	Event window	Mean	Std.Dev	t-statistic	
					Value	probability
BHAR	119	1	-0.0948	0.7598	-1.360	0.176*
	119	6	-0.0787	0.5349	-1.605	0.111*
	117	12	-0.0592	0.3834	-1.670	0.097**
	112	24	-0.0701	0.5759	-1.711	0.089**
	111	36	-0.0878	0.6722	-1.376	0.171*
	99	48	-0.0441	0.3413	-1.284	0. 202
	84	60	-0.0176	0.0361	-1.969	0.051**

Panel (C) Wealth Relative (WR)						
	N	Event window	Mean	Std.Dev	t-statistic	
					Value	probability
WR	119	1	1.0306	3.3993	3.307	0.000***
	119	6	0.9839	3.1254	3.434	0.000***
	117	12	0.9827	4.8585	2.188	0.000***
	112	24	0.9674	3.3536	3.053	0.000***
	111	36	0.9696	2.9381	3.477	0.000***
	99	48	0.9694	2.6976	3.576	0.000***
	84	60	0.9707	2.7535	3.231	0.000**

***, **, *, stands for statistical significance at the 1,5 , and 10 percent level respectively.

Panel (A) from table (10) above reveals that the means for cumulative abnormal returns (CAR) during the event window are different from zero (0.0290, -0.0187, -0.0224, -0.0393, -0.0333, -0.0301, -0.0325). Those differences are not proved statistically depending on t-statistic value and its p- value of (0.113, 0.063, 0.109, 0.051, 0.080, 0.118, 0.130). Hence; at 5% level of significance the null hypothesis about the differences of the means of (CAR) from zero using this benchmark (H010) is accepted due to p-values which are more than 5%. Level of significance.

On the other hand as displayed in panel (B); it appears that the means for buy and hold abnormal returns (BHAR) are respectively different from Zero (-0.0948, -0.0787, -0.0592, -0.0701, -0.0878, -0.0441, -0.0176). Actually those differences are not also proved statistically according to t-statistic values and its p- values of (0.176, 0.111, 0.097, 0.089, 0.171, 0.202, 0.051). Therefore, at 5% level of significances; the null hypothesis about the differences of means of BHAR from zero value (H 011) is accepted due to p- values which are more than 5% level of significance.

Finally, the panel (C) in the same table illustrates that the means for wealth relative (WR) are respectively different from zero of (1.0306, 0.9839, 0.9827, 0.9674, 0.9696, 0.9694, 0.9707). Those differences are proved statistically for wealth relative (WR); which have respectively a p-values of (0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000). Therefore, at 5% level of significance; the null hypothesis about the differences of the means

of (WR) from zero value (H012) is rejected due to t- statistics values and its p- values which are more than 5% level of significance.

Table (11) : Hypothesis testing results

	Hypothesis number		The Null Hypothesis	Result
Benchmark	**Benchmark number one: Amman Stock Exchange Index (ASEI)**			
	AR	H01	The abnormal return is not significantly different from zero once applied (ASEI) as a benchmark.	Rejected
	CAR	H02	The cumulative abnormal return is not significantly different from zero once applied (ASEI) as a benchmark. .	Rejected
	BHAR	H03	The buy and hold abnormal return is not significantly different from zero once applied (ASEI) as a benchmark.	Rejected
	WR	H04	There is no significant statistical difference in the wealth relative once applied (ASEI) as benchmark.	Rejected
	Benchmark number Two: Matching Firms (MF)			
	AR	H05	The abnormal return is not significantly different from zero once applied(MF) as a benchmark.	Rejected
	CAR	H06	The cumulative abnormal return is not significantly different from zero once applied (MF) as a benchmark. .	Accepted
	BHAR	H07	The buy and hold abnormal return is not significantly different from zero once applied (MF) as a benchmark.	Accepted
	WR	H08	There is no significant statistical difference in the wealth relative once applied (MF) as benchmark.	Rejected
	Benchmark number Three: Capital Assets Pricing Model (CAPM			
	AR	H09	The abnormal return is not significantly different from zero once applied(CAPM) as a benchmark.	Rejected
	CAR	H010	The cumulative abnormal return is not significantly different from zero once applied (CAPM) as a benchmark. .	Accepted
	BHAR	H011	The buy and hold abnormal return is not significantly different from zero once applied (CAPM) as a benchmark.	Accepted
	WR	H012	There is no significant statistical difference in the wealth relative once applied (CAPM) as benchmark.	Rejected

3. Conclusions and Recommendations

i. Conclusion

This study investigated the long-run abnormal performance of Jordanian IPOs during the period from 1st January 1993, to 31st December 2011, using the most common approach in the literature which is, the event study approach. And using three benchmarks which are, the Amman stock exchange index (ASEI), matching firms (MF), and the Capital Assets Pricing Model (CAPM). Beside using three aggregating models to estimate the long-run performance of Jordanian IPOs when applying each benchmark which are , the cumulative abnormal return (CAR),buy and hold abnormal return (BHAR), and the wealth relative (WR).

The results of the study are consistent with the results of many previous studies, regarding the long-run underperformance of IPOs. Such as (Ritter, 1991). (Levis 1993). (Loughran and Ritter 1995), and (Drobetz.et.al, 2005), and many literature that examined the long-run performance of IPOs. The study has provided further evidence of the long-run underperformance of IPOs phenomenon. Knowing that the level of Jordanian IPOs underperformance differs based on the benchmark employed (Espenlaub and Gregory, 2000). (Schuster, 2001). (Brave and Compers, 1997).

Based on the study results, the Jordanian IPOs companies were significantly underperforming the Amman stock exchange index (ASEI) over 60 months after going public by about,(-66.2% CAR,-34%BHAR, and 82% WR).Whereas, by using the matching firms (MF) as a second benchmark, the Jordanian IPOs companied reported a level of underperformance estimated by about, (-20.6%CAR,-48%BHAR,and 94%WR)after 60 months of issuance. Finally the third, and the last benchmark employed in the study, which is the Capital Asset Pricing Model (CAPM), the Jordanian IPOs companies reported a level of underperformance estimated by about (-31.3%CAR,-22.5%BHAR,78% WR)after 60 months of going public .

In this aspect of the study, the results are consistent with the finding of (Braik, 2010) that found a positive relationship between the firm age and its long-run performance, but contradicts the same study regarding the offers size and its relationship with long-run performance; the study does not find any relationship between them. Also the study results are consistent with the findings of (Khurshed, 1999) which found there is a positive relationship between the firm size and its long-run performance, as this study has proved.

ii. Recommendations

In the light of the research results and conclusions, the researchers recommends that:

1. Investing in IPOs might be profitable in the short run, but in the long-run it is hazardous to the investor's wealth.
2. The level of long-run underperformance of Jordanian IPOs requires that it is necessary to recommend investors that " active trading strategies and plans should take place ".
3. Investing in the financial IPOs is a remarkable investment decision for those investors who are interested in investing in IPOs, taking into consideration that diversification is less risky.
4. For issuers: they should pay attention to the timing of going public, and identifying the appropriate time in the market and company itself for going public .
5. The Jordanian securities commission should encourage establishing more IPO companies through public offering by reducing some of constraints and giving the IPO companies some advantages as well as the sufficient support by the Jordan securities commission.

iii. Avenues for future research.

Concerning the further research, the researchers suggests the following:

1. Investegating the long-run performance of Jordanian initial public offerings (IPOs) , using other benchmarks such as , the fama and French three factors model , size decil portfolio, and fama and French multi -factors model .
2. Examining the performance of other kinds of initial offerings, like seasoned equity offerings, and bonds.
3. The role of underwriter in the going public process.

References

Agarwal, A, (2012),"The impact of rights issue on stock returns in India". Journal of Asia – Pacific Finance and Accounting Review, Vol 1, No 1, pp 5-16.

Ajlouni, M & Abu-Ein, O, (2009), "Long-run performance of initial public offerings in an emerging market: the case of Amman stock exchange", Journal of International Finance and Economics, vol. 9, no. 1, pp. 25–44.

Al-Khas, Z,Khammash, T(2007), "The Jordanian IPOs market in 2007", Working Paper, ABC Investments.

Alanazi, Ahmed S. (2013), "IPO Underpricing and Long-Run Performance: Evidence from the Six Countries of the Gulf Cooperation Council (GCC)", working paper,http://papers.ssrn.com/sol3/papers.cfm?abstract

Amman Stock exchange reports, (2011). Available on http:// www.ase.com.jo

Amman Stock exchange reports, (2012). Available on http:// www.ase.com.jo

Andron, B, Eaff, B, Michal, F.(2008), "Right offerings take up, renounce a bility, and underwriter status". Journal of Financial Economics, No 1, pp 328-346.

Aron.A,Aron .E, and Coups.J,(2005),"Statistics for the behavioral and social sciences", 3rd edition, pearson prentice hall international edition ,USA.

Barber, M, Lyon, D, (1997),"Detecting Lon run abnormal stock returns: the empirical power and specification of test statistics",. The Journal of Financial Economics, Vol 43, pp 341-372.

Barber, M, Lyon, D, Tasia, C,(1999), "Improved methods for test of long-run abnormal stock returns", the Journal of Finance, Vol.27, No 1.

Benninga,S, Helmantel, M, Saria, O,(2004),"The timing of initial public offerings", Journal of Financial Economics, article in press, ISOP, pp 100-180.

Braik, F, (2010), "An empirical investigation of initial public offerings price performances-evidence from Jordanian stock market", Athesis for the degree of MBA in Business administration and management information system department, mutah university, 2010.

Brav, A, Gompers, P,. (1997). "Mythor reality ? the long-run under performance of initial public offerings: evidence from venture and nonventure capital – backed companies", Journal of Finance , Vol 52, pp 1791-1821.

Burchardi, H, (2001),"Clustering of intial public offering, information revelation, and underpricing". European Ecouomic Review, Vol 45, pp 353-383.

Carter, B, Frederik, H, Ajai, K, and Siugh,(1998),"underwriter reputation, initial return, and long-run performance of IPO stocks"Journal of Finance, Vol 53, pp 285-311.

Comper, P, Lerner, J,(1999)," An analysis of compensation in the U.S venture capital partnership", Journal of Financial Economics, Vol 51, pp 3-44.

Comper, P., Paul, A., Josh, L. (2001)."The really long-run performance of initial public offerings: the pre- nasdaq evidence", the Journal of Finance, Vol 58, pp 1355-1392.

Dawson, M, (1987), "Secondary stock market performance of public offerings in Hong Kong, Singapore, and Malaysia", the Journal of Busieness, Finance, and Accounting, Vol.14, pp 65-76.

Desai, H, Jain, P., (1997)." Long-run common stock returns following splits and reverse splite"., the Journal of Business, Vol 70, pp 409-433.

Dimovski, W, Brooks, R. (2008),"The underpricing of gold mining initial public offerings", Journal of International Business and Finance, Vol 22, pp 1-16.

Drobtz, W, Kammermann, M, Walchli, (2005), "Long-run performance of initial public offerings: the evidence for switzerland", Schmalebach Business Review, Vol 57, pp 253-275.

Erdogan, A. (2010). "The long-run performance of initial public offerings: the case of turkey", European Journal of Economic, Finance and Administrative Sciences, ISSN issue 26, pp 1450-2275.

Espenlaub, S, Gregory, A, (2000), "Re-assessing the long term underformance of UK initial public offerings", European Financial Management, Vol 6, pp 319-342.

Espenlaub, S, Touks, I, (1998)," Post initial public offerings directors, sales and reissuing activity: an empirical test of IPOs signaling models", Working Paper, School of Accounting and Finance, University of Manchester.

Fama, E, French, K,(1992), "The crose-section of expected stock returens", Journal of Finance, Vol XLVII, NO 2, pp 156-171.

Fama, F, French, R,(1993)."common risk factors in the returns on common stocks and bonds"., the Journal of Financial Economics, Vol 33, pp 3-56.

Fama, F, French, R,(1998),"Market efficiency, long term returns and behavioral finance", the Journal of Financial Economics, Vol 4, pp 283-306.

Gomper, P, Lerner, J, (1999). "Conflict of interest in the issuance of public securities: evidence from venture capital", Journal of Law and Economics, Vol 42, pp 1-28.

Grogory, A, Cuermat, C, AL-Shawawreh, F (2010), "UK IPOs: Long-run returns, behavioral timing and pseudo timing", Journal of Business Finance and accounting Vol:37, issues, 5-6, PP 612-647.

Hamao, Y, Packer, F, Ritter, J. (2000),"Institutional affiliation and the role of venture capital: evidence from public offering in Japan", the Journal of Pacific Basin Finance, Vol 8, pp 529-558.

Ibboston, G. (1975). "Price performance of common stock new issues", the Journal of Financial Economic, Vol 2, pp 235-272.

Ikenberry, D, Lakonishok, J, Vermaelen, T (1995). "Market under reaction to open market share repurchases", Journal of Financial Economics, Vol 39, pp 181-208.

Ikenberry, D, Rankine, G, Stice, E,.(1996)." What do stock split really signal", Journal of Financial and Quantitive Analysis, Vol 31, pp 357-377.

Jordan Securities Commission reports, (2011), Available on www.jsc.gov.jo

Kasimati, E, Dawson, P, (2005), "Initial and after market performance of IPO stocks): evidence from Greece", European Review of Economics and Finance, Vol 4, No3, pp 23-31.

Khurshed, A. (1999). "The long-run performance of IPOs", Working Paper, Weather Head School of Management.

Kooli, M, Suret, J, Francois, J(2004),"Do IPOs really underperform in the long-run? New evifence from the Canadian market", Journal of Finance, Vol 26, pp 128-147.

Koop, G, Li, K, (2001), "The valuation of IPO and SEO Firms", the Journal of Empirical Finance, Vol.8., pp 375-401.

Lakonishok, J, Vermaelen, T, (1990)." Anomalous price behavior around repurchase tender offers", the Journal of Finance , Vol 45, pp 455-477.

Leite, T, (2004), "Excess initial returns in IPOs", the Journal of Financial Intermediation, Vol 13, pp 359-377.

Levis, M.(1993). "The long-run performance of initial public offerings : the UK experience 1980-1988", the Journal of Financial Management, Vol 22, pp 24-41.

Ljungqvist, A,(1997),"Pricing initial public offerings: Further evidence from Germany", European Economic Review, Vol 41, pp 1309-1320.

Loughran, T, Ritter, J(2002)."Why don't issuers get upset about leaving money on the table in IPOs?", the Review of Financial Studies, Vol.15, pp 413-443.

Lyn, E, Zychowics, E.(2003),"The performance of new equity offerings in hungary and Poland". The Journal of Global Finance, Vol 14, pp 181-195.

Makinlay, A.(1997),"Event studies in economics and finance", the Journal of Economic Literature, Vol. 27, pp 13-39.

Mitchell, M, Stafford, E. (2000). "Managerial decisions and long term stock price performance", The Journal of Business, Vol 73, pp 287-320.

Ngatuni, P, Capstaff, J, Marshall, A, (2007),"Long term performance following rights issues and open offers in the UK", Journal of Business, Finance, and Accounting, Vol 34, pp 33-64.

Omran , Mohammed, (2005) , "Underpricing performance of share issue privatization in the Egyptian stock market", Journal of Financial Research ,Vol. 28, 2, pp 215–234, June

Ritter, J, (1984), "The hot issue market of 1980", Journal of Business, Vol 57, pp 215-240.

Ritter, J, Welch, I, (2002) "A review of IPO activity, pricing, and allocation", Journal of Finace, Vol 2, No 4, pp 125-148.

Ritter, J,(1998),"Initial public offerings", Journal of Finance, Vol 2, No 1, pp 5-30.

Ritter, J. (1991). "The Long-run performance of initial public offerings", the Journal of Finance, Vol 46, pp 3-27.

Ritter, J.(2001),"Some factoids about the 2000 IPO market", Working Paper University of Florida.

Ritter, J., Loughran, T.(1995). "The new issues puzzle"., the Journal of Finance, Vol 5, pp 23-51.

Saleh, W. and Mashal, A (2008),"The underperformance of IPOs: the sensitivity of the choice of empirical method", east-west, Journal of Economics and Business, Vol. X1-2008, No 1 and No 2.

Sapusek,A,.(2000). "Bench mark- sensitivity of IPO long-run performance: An empirical study for Germany", Schmalenbach Business Review, Vol 52, pp 374-405.

Schuster,J, (2001),"The cross-section of European IPO return " , Working Paper , London School of Economics .

Sekaran, U,. (2007),"Research methods for business: A skill Building approach",4rd edition, Southern Illinois University at Car Bondale.

Sohn, C, Tsui, A, Zhang, F. (2001),"An empirical assessment of share IPO underpricing in China", the Journal of Business, Finance., and Accomiting, Vol 72, pp 142-189.

Strong, N,(1992),"Modeling abnormal returns: review article". The Journal of Business, Finance, and Accounting, Vol 19, issue 4, pp 469-655.

Suchard, J, Owen, S, (2008),"The pricing and impact of Australian rights issues of equity", Applied Financial Economics, Vol 18, pp 1147-1160.

Thiagarajan, R, (2001), "buy, sell or hold? An event study analysis of significant single day losses in equity value" journal of Finance, Vol.20, pp 221-305.

Wang, C, Young, M, Chi, J,(2010). "long-run out performance of Chinese initial public offerings", the Chinese Journal of Economy, Vol 43, No 5, pp 62-88.

Welch, I, (2000), "IPOs: The Initial public offerings": working paper, available on the internet at www.welch.econ.brown.edu.

Yi, H,(2001), "Pre-offering earnings and the long-run performance of IPOs", International Review of Financial Analysis, Vol 10, pp 53-67.