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An Empirical Investigation of IPOs' Long-Run Performance Evidence from the Egyptian Exchange

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Abstract

This paper investigates the long-run financial performance of 35 newly listed firms on the Egyptian Exchange during the period 2005-2018. The objective of this study is to analyze whether Egyptian Initial Public Offerings (IPOs) under-perform or over-perform the market. Post trading performances are calculated by buying and hold return, and buy and hold abnormal returns in excess of EGX-30 index's return. Multivariate regression models were implemented to identify the influencer of the performance, based on, offer, firm and market characteristics and their interaction effects. In line with the literature, our results reveal the existence of negative normal and abnormal long-run IPOs returns. The Egyptian IPOs Long-run poor performance presents a positive relationship with underpricing. Results show that IPOs listed on Egyptian Exchange provided negative equally weighted cumulative adjusted buy-and-hold's returns and abnormal returns of 9% and 20%, respectively. Also, one-year value-weighted cumulative adjusted returns underperform the market by 31% and 15.3% in terms of buy-and-hold's returns and abnormal returns, respectively.

Keywords

Initial Public Offerings (*IPO*), Underpricing, Underperformance, Long-Run Returns Buy and Hold Return, Buy and Hold Abnormal Return

1. Introduction

Going public allows firms to access public capital which may be used to pay off debt, business development, and growth or expansion. It is argued by Perera and

Kulendran (2016) that IPOs influence financial economics since high-growth firms tend to generate new jobs and create revenue. The IPOs markets existed as long as stock markets themselves are integral to their historical development. They provide entrepreneurs with the opportunity to raise financing either for the firm or for themselves and investors with the opportunity to invest in new firms. Whether today or a century ago, entrepreneurs looking to take their firm public is concerned with the fair value at the time of going public and how will the shares perform after the IPO?

Loughran and Ritter (2004) and Ritter and Welch (2002) provided evidence that IPOs tend to exhibit substantial fluctuations in activity over time, where they are underpriced, rise in price in initial trading, and tend to perform poorly over the long run. These abnormalities are recognized in most of the financial markets around the world but the degree of occurrence varies across markets. Ritter (1987) examined the US IPOs and emphasized that underpricing occurs when the closing price at the end of the first day of trading is higher than the initial offer price, meaning that the value at which the company sold its shares to the public was lower than their actual market value.

The investigation of IPO's post-trading performance has been one of those issues that are never laid to rest. The continued quest for the reasons for underpricing IPOs and their subsequent poor post-trading long-run returns inspired researchers to study these anomalous market behaviors over the last two decades. Because of its long history and the massive number of IPOs, the U.S stock market was investigated extensively. The long-run price behavior after IPOs has become widely recognized not only in the meaningful developed stock markets like Germany or the UK but also in smaller economies such as India and Malaysia. Moreover, equity offerings in emerging markets have experienced a fast interest growth in recent years. Large trading volume and growth potential encourage the investigation of IPOs' long-run performance, whereas in smaller emerging markets the aftermarket price behavior of IPO is still not sufficiently investigated, due to relatively few security issues and partly due to difficult access to the full range of historical data. The main objective of this paper is to examine the aftermarket price behavior of IPOs in Egypt.

The paper is divided into five sections as follow.

2. Literature Review

Evidences of IPOs' long-run underperformance are not as widespread as that of short-run underpricing of IPOs. However, under performance of IPOs is an arguable issue among the researchers due to their contradictory results and findings. Gompers and Lerner (2003) and Ibbotson and Jaffe (1975) have found that underpriced IPOs have no abnormal performance in the long run. Chi et al. (2010) and Thomadakis et al. (2012) reported that IPOs over perform or do not underperform in the long run market. Abukari and Vijay (2011) argued that different performance measures or methodologies give mixed results in IPOs' long-run

performance. How (2000), Lee et al. (2003) and Ritter (1991) found that under-priced IPOs appreciated in the long run. It was documented by Ritter (1991) that the long run performance of US's IPOs for the period 1975-1984 underperformed by 34.47% for the three years after going public.

Studying financial performance of Egyptian IPOs over the period 1994-1998, Omran (2005) indicated that investors can earn positive aftermarket abnormal returns of 41%, on average, over a one year period and negative aftermarket abnormal returns over a three and five year horizon. According to Johnston and Madura (2002), the aftermarket performance of IPOs is initially favorable but weakens over time, where the long-run performance of IPOs in the US decrease over time, and the market underperformed by the end of one year. Álvarez and González (2005) found negative long-run abnormal returns in the Spanish IPOs' market. Further evidences provided by Moshirian et al. (2010) support these findings, revealing that the existence of long-run underperformance for Asian IPOs depends deeply on the methodology used for evaluation. In contrast to the underperformance argument, the study of Ahmad-Zaluki et al. (2007) documented significant over performance in the long run in terms of Equally Weighted (EW) return, Cumulative Abnormal Return (CAR) and Buy-and-Hold Abnormal Return (BHAR).

Over the past century, many researchers had used different determinants and characteristics as proxies to explain the theoretical background in relation to IPOs performance on the long run. Dimovski et al. (2011) proposed financial and non-financial characteristics to explain the overpricing of IPOs in Australia. Firms' financial, operational and IPO's characteristics were used as proxies of overpricing determinates by Bhabra and Pettway (2003) to study IPOs prospectus information. In addition, Johnston and Madura (2002) proposed issue characteristics and market characteristics. However, Ogden et al. (2003) documented that IPOs' characteristics can be categorized into the two areas of firm-specific characteristics such as age, firm size, leverage, profitability, dividend policy and offer characteristics such as offer price, valuation statistics, primary shares, secondary shares, underwriter spread, ownership and lockup.

Event-time, calendar-time and mixed approaches are usually used to measure the long-run performance of IPOs. In relation to the other approaches, the event time approach commonly used to study the IPOs' long-run price performance capitalizing on CAR, BHR and EWR as the main performance measures, while the CAPM and FF models are used to measure calendar time return, and mixed approach uses all performance measures used in the event and calendar time approaches. Conversely, long run performance is generally responsive to the methodology used, such as the method of performance measurement as argued by Abukari and Vijay (2011) and Ahmad-Zaluki et al. (2007), sample period as argued by Ritter and Welch (2002), sample and company's size as argued by Bird and Yeung (2010), the benchmark as argued by Abukari and Vijay (2011), the weighting method as argued by Kooli and Suret (2004) and Gompers and Lerner

(2003). Following literatures, this paper examines the long-run underperformance of IPOs based on the three main characteristics of IPOs; issue-specific, firm-specific and market-specific is characteristics.

3. Research Methodology

This paper uses secondary data collected from the Egyptian exchange database, IPOs puplished prospects on Egyptian exchange web site. We examine long-run market performance of 35 successful IPOs in the Egyptian market over the period 2005-2017 based on event-time and calendar-time approach. In line with previous researchers, this paper measures the IPO long-run market performance using BHR and BHAR calculated using equally weighted and value weighted return up to one post-trading period using an event-time approach, which commonly accepted in the IPOs literature for investigating long run market performance.

The time window to measure the long-run performance is one year. In this time window, the performance measures calculated using daily closing prices of IPO based on the event-time approach.

BHR and BHAR used to measure the long-run performance calculated by Equations (1) and (4) as followed.

$$BHR_{i,t} = \prod_{t=start}^{\min(T,delist)}\left(1+r_{i,t}\right)-1 \tag{1}$$

where $r_{i,t}$ is the daily return on company i started from day t, in which the event takes place, and $\min(T, delist)$ is the earlier of the last day of trading or delisting. The IPOs' average BHR returns ($\overline{BHR}$) based on EW return calculated by Equation (2), where VW returns calculated by Equation (3) as follows:

$$\overline{BHR}_{EW_T} = \frac{1}{n}\sum_{i=1}^{n}BHR_{i,t} \tag{2}$$

$$\overline{BHR}_{VW_T} = \frac{1}{n}\sum_{i=1}^{n}BHR_{i,t} \tag{3}$$

Following Loughran and Ritter (1995), the market-adjusted BHAR calculated as the difference between the stock's BHR and the market index's BHR as follows:

$$BHAR_{i,t} = \left[\prod_{t=start}^{\min(T,delist)}\left(1+r_{i,t}\right)-1\right] - \left[\prod_{t=start}^{\min(T,delist)}\left(1+r_{m,t}\right)-1\right] \tag{4}$$

where $BHAR_{i,t}$ is the market-adjusted buy-and-hold daily return of company i started from day t, $r_{i,t}$ and $r_{m,t}$ are the daily return on company i and EGX-30 market index, respectively, in which the event takes place, and $\min(T, delist)$ is the earlier of the last day of trading or delisting. The IPOs' average BHAR returns ($\overline{BHAR}$) based on EW return calculated by Equation (5) and VW return calculated by Equation (6) as follows:

$$\overline{BHAR}_{EW_T} = \frac{1}{n}\sum_{i=1}^{n}BHAR_{i,t} \tag{5}$$

$$\overline{BHAR}_{VW_T} = \frac{1}{n}\sum_{i=1}^{n}BHARR_{i,t} \tag{6}$$

To identify the association between the IPOs' long-run market performance and its explanatory variables, the study developed the following hypotheses based on the literature: (H_1) Egyptian IPOs underperform in the long run, (H_2) There is a significant relationship and relative impact between the long-run performance and the study independent variables, and (H_3) Jointly, all independent variables have equal relative impact on the long-run performance.

To find out the major determinants of the IPOs' long-run performance, this study developed multiple regression models. In this study, we measure IPOs' Issue-specific characteristics by 1) IPO Period (IPOP) calculated as LOG of Period from opening to closing days of the offer, 2) First Day Volume Turnover (FDVT) measured by first day trading volume divided by number of shares sold in the IPO, 3) Oversubscription Ratio (OVSR) calculated as total number of received subscriptions divided by total number of shares offered for subscription, and 4) Gross Proceeds (GRPO) calculated as LOG of number offered shares multiplied by the offering price. We measure the IPOs' Firm-specific characteristics by 1) Original ownership (OWNS) calculated as Percentage of shares retained by original owners, 2) Firm age (AGE) calculated as the LOG of days between the days of creation and listing, 3) P/E Ratio (P/ER) calculated as Offer price to per-share earnings, and 4) Return on Assets (ROA) calculated as Total return divided by the total assets in the last income statement before IPO. The IPOs' Market-specific characteristics by 1) Market Return (MR) calculated as LOG of market returns before the closing date of the offer 60 day and 2) Market volatility (MRVO) calculated as LOG of Standard deviation of 60 daily market returns before the closing date of the offer. Utilizing OLS, Equation (7) represents the long-run multiple regression models used to analyze the main and interaction effects of the studied Issue-specific, Firm-specific and Market-specific characteristics on the long-run IPOs' performance measured by *LRR* in terms of BHA and BHAR.

$$
\begin{aligned}
LRR_i = \alpha_0 &+ \beta_1\left(GRPO_i\right) + \beta_2\left(IPOP_i\right) + \beta_3\left(FDTV_i\right) + \beta_4\left(OVSR_i\right) \\
&+ \beta_5\left(OWNS_i\right) + \beta_6\left(AGE_i\right) + \beta_7\left(MR_i\right) + \beta_8\left(MRVO_i\right) \\
&+ \beta_9\left(P/ER_i\right) + \beta_{10}\left(ROA_i\right) + \varepsilon_i
\end{aligned}
\tag{7}
$$

4. Analysis of Data and Discussion of Results

Table 1 presents the descriptive statistics of one year's post-trading BHR and BHAR, as long-run buy-and-hold investment strategies.

Table 1 shows Egyptian's IPOs' maximum loss over one year counts for 77.2% while maximum gain over the same period counts for 32.8% with an average loss of 9.7% and 31.6% standard deviation of the subscription price in terms of BHR, while one year IPO's maximum loss counts for 62.3% and maximum gain of 50.6% with an average loss of 20.6% and 27.9 standard deviation of the subscription price in terms of BHAR. Table 1 shows that the minimum, maximum and average percentage of shares retained by original owners (OWNS) counts for 51%, 99.2% and 85.3%, respectively, which means that "although firms included

Table 1. Descriptive statistics of IPOs' post-trading long-run performance.

	N	Minimum	Maximum	Mean	Std. Deviation
			Dependent variables		
One Year BHR	35	−0.772	0.328	−0.097	0.316
One Year BHAR	35	−0.623	0.506	−0.206	0.279
			Independent variables		
GRPO (Billions LE)	35	5.766	9.704	7.700	1.212
OWNS (%)	35	0.510	0.992	0.853	0.106
IPOP (Days)	35	3.000	15.00	8.700	2.790
MR (%)	35	−0.351	0.356	0.028	0.145
ROA (%)	35	0.028	0.273	0.101	0.072
P/ER (Times)	35	0.704	1.955	1.342	0.293
OVSR (Times)	35	2.000	60.00	15.10	0.128
AGE (Years)	35	3.455	5.129	4.489	0.395
FDTV (%)	35	0.037	0.704	0.197	0.154
MRVO	35	2.097	3.187	2.558	0.227

Notice: GRPO: Gross Proceeds, OWNS: Original Ownership, IPOP: IPO Period, MR: Market Return, ROA: Return on Assets, P/ER: P/E Ratio, OVSR: Oversubscription Ratio, AGE Firm age, FDVT: First Day Volume Turnover, and MRVO: Market Volatility.

in the study went public, they are still privately held by the original owners" with a variation of 10%. The IPOs included in the study closed in 8 - 9 days on average, with a maximum closing period of 15-days and minimum of 3-days, as shown in Table 1. In terms of Market Returns (MR) after 60 days from the closing date of the offer, Table 1 shows a maximum loss, minimum and average profit of 35.1%, 35.6% and 2.8%, respectively with high volatility of 14.5%. The maximum, minimum, and average Return On Assets (ROA) over 60-days period for newly listed firms in the Egyptian Stock Exchange are 2.8%, 27.3% and 10.1% respectively. The minimum, maximum, and average oversubscription ratio (OVSR) is 2, 60 and 15.1 times respectively, as shown in Table 1. While the minimum age for newly listed firms count for 3.5 years, the maximum age counts for 5.12 years and it is 4.5 years on average, as reviled in Table 1. These statistics indicate that newly established firms are more willing to list in the exchange than old firms are. The minimum First Day Volume Turnover (FDVT) as a percentage of the issued shares in the IPO counts for 3.7% as shown in Table 1, while it is 70.4% at maximum and 19.7% on average. The LOG of the minimum, maximum and average daily market returns volatility (MRVO) over 60 days after the closing date of the offer, as shown in Table 1 counts for 209.7%, 318.7% and 255.8%, respectively. This indicates that Egyptian's IPOs are highly volatile.

4.1. Correlation Analysis

Table 2 illustrates the correlations between the explanatory variables. It shows negative correlation between BHR and GRPO, IPOP, MR, and P/ER, while it positively correlated with BHAR, OWNS, ROA, OVSR, AGE, FDTV, and MRVO. As shown in Table 2, the BHR is negatively correlated with the GRPO from the IPO (−0.30), MR (−0.26), P/ER (−0.15), and IPOP (−01.10) correlations. The BHR is highly positively correlated with the Age of the firm to be listed in the Egyptian Stock Exchange through the IPO (0.59) followed by ROA (0.37), BHAR (0.32) and less positively correlated with MRVO (0.18), FDTV (0.11), OWNS (0.07), and OVSR (0.05), as shown in Table 2.

While BHR over one year period is negatively correlated to GRPO, the BHAR over one-month period is positively correlated to GRPO, as shown in Table 2. This explained by the setup of Egyptian IPOs, where the IPO's price protected by the issuer for 30 days and the subscribers are guaranteed the subscriptions price for that period. Table 2 shows that BHAR is negatively correlated to the OWNS and while BHR is positively correlated to the OWNS. While BHAR is positively correlated to the IPO Period, the BHR is negatively correlated IPO Period. Also, Table 2 shows that FDVT is positively correlated to the BHR and negatively correlated to the BHAR.

4.2 Long Run Performance of IPOs

The IPOs' long run performance was analyzed using the, one year BHR and BHAR in comparison to Egx-30 index's return as benchmark. The determinants of the long run performance identified using multiple regression models with a

Table 2. Correlation matrix of the explanatory variables.

	BHR	BHAR	GRPO	OWNS	IPOP	MR	ROA	P/ER	OVSR	AGE	FDTV	MRVO
BHR	1											
BHAR	0.32	1										
GRPO	−0.30	0.19	1									
OWNS	0.07	−0.43	−0.44	1								
IPOP	−0.10	0.17	0.43	−0.02	1							
MR	−0.26	−0.24	−0.18	0.13	0.04	1						
ROA	0.37	0.27	0.11	0.06	0.04	−0.93	1					
P/ER	−0.15	−0.37	−0.21	0.16	0.18	0.55	−0.42	1				
OVSR	0.05	0.01	−0.03	−0.02	0.38	0.12	−0.04	0.17	1			
AGE	0.59	0.11	0.12	−0.22	0.06	−0.13	0.13	0.01	−0.03	1		
FDTV	0.11	−0.30	0.10	0.17	0.18	−0.21	0.22	−0.01	0.24	−0.06	1	
MRVO	0.18	0.25	0.05	−0.30	−0.24	−0.10	0.04	−0.20	−0.33	−0.03	0.09	1

Notice: GRPO: Gross Proceeds, OWNS: Original Ownership, IPOP: IPO Period, MR: Market Return, ROA: Return on Assets, PER: P/E Ratio, OVSR: Oversubscription Ratio, AGE Firm Age, FDVT: First Day Volume Turnover, and MRVO: Market Volatility.

main effects and interaction effects analysis. The long run performance examination based on one year BHR and BHAR post trading indicates that the Egyptian IPOs were underperforming in the long run as reported in Table 3. Given R, R^2, and adjusted R^2, and as reported in Table 3, the one-year BHR has more explanatory power of the IPOs' long-run performance than the one-year BHAR.

It is statistically significant that IPOs underperform over the one-year period whatever BHRs and BHAR calculated using the EW and VW as shown in Table 3. Calculated using EW, the BHRs loss 9.66% within one year from the subscription price, while it loss 31.18% of the subscription price if calculated using VW, as reported in Table 3. Analyzing the one-year BHAR, Table 3 shows that IPO loss 20.64% as measured by EW, while it loss 15.32% as measured by VW in comparison to EGX-30. This result is associated with the underpricing phenomenon of IPOs, which accepted as a universal phenomenon.

4.3 Determinants of IPOs' Long Run Performance

Using multiple regression models, Table 4 shows the impact of firm age, IPO, and market specific characteristics on the one-year BHR and BHAR. The one-year BHR positively and significantly affected by the firm and market specific characteristics, but not by IPOs' specific characteristics. On the other hand, the one-year BHAR significantly-negatively affected by IPOs' specific characteristics, but not by firm and market specific characteristics. This explained as time

Table 3. IPOs' long-run performance.

	One-Year BHR	One-Year BHAR
Equally Weighted (EW)	−9.66%	−20.64%
Value Weighted (VW)	−31.18%	−15.32%
R	0.819	0.523
R^2	0.671	0.273
Adjusted R^2	0.628	0.251
Std. Error of Estimate	0.193	0.242
P−value	0.000	0.001

Table 4. Determinates of IPOs' long-run performance.

	One-Year BHR	One-Year BHAR
AGE	0.646	N/A
GRPO × P/ER	0.669	N/A
ROA × FDTV	0.322	N/A
P/ER × MRVO	0.432	N/A
IPOP × P/ER	N/A	−0.523

Notice: All results are significant at 99% level.

passes investors relay on facts and the IPO specific characteristics is not significant in the investor's decision.

Results of multiple regression models for one-year's BHR reported in Table 4 show a statistically significant positive relationship between firm AGE and one-year post trading BHR. This result is in line with Ritter (1991) who found that younger IPOs has poor long run performance due to the over optimism and fads hypotheses. Moreover, results shown in Table 4 indicate statistically significant positive relationship between the interaction effects of issue subscription size (GRPO) with P/ER ratio. This result confirms the argument of Chen and Ritter (2001), Cai et al. (2008) and Zielinksi (2013). For the one-year's BHAR, the interaction between the GRPO and P/ER cannot detect since strategic investors usually invest in well-performing large companies where operating performance of the firm has a direct influence on its market value. Through the first year investors compare between the disclosed financial statements and the prospect, projection and they can recognize that the IPO was over-priced or under-priced. Furthermore, reported results in Table 4 show statistically significant positive interaction effect between ROA and FDTV and one-year post trading BHR. These results confirm the argument of Chan, Wang and Wei (2004), and Varaiya and Pukthuanthong (2007), who argue that the higher first day trading volume leads to investor interest but it is a negative market signal because this interest never continued on the long run. Also, results show statistically significant positive relationship between the interaction effect of P/ER with market volatility MRVO and one-year post trading BHR as reported in Table 4. These results agree with Zielinksi (2013) and Omran (2005) expectation of positive interaction between return measured by P/ER and risk measured by MRVO. Finally, the multiple regression models for one-year post-trading BHAR reported in Table 4 show that there is a statistically significant negative relationship between the inter-action effects between IPO periods IPOP with P/E ratio. This result is in line with Lee et al. (2003), How (2000), and Zielinksi (2013) findings. Table 4 shows IPOs with higher P/ER and long IPOP will have poor market performance on the long run because investors value IPOs based on prospects appear to be overly optimistic that earnings growth will continue.

5. Conclusion

Consistent with literature from developing and emerging markets, this paper shows that Egyptian IPOs are subject to long-run underperformance. Therefore, potential investors should be conscious that short-run capital gain resulting from underpriced IPOs will be wiped out as Egyptian IPOs will eventually exhibit significant underperformance in the long run. However, this paper reveals that the performance of small-size IPOs is better than that of large-size IPOs, implying that investors should look for opportunities where companies are likely to make a relatively small offer on the market. Moreover, potential investors should be aware that long-run market performance of older companies is better than young

companies. Also, potential investors should be aware that the higher first-day trading volume leads to investor interest but it is a negative market signal because this interest never continued in the long run. This paper covers the period from 2005 to December 2017 because of the data limitation and accuracy. Finally, this paper determined IPO characteristics used to predict returns of IPO companies on the Egyptian exchange.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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