



## SHORT-TERM PRICE-PERFORMANCE ANALYSIS OF INITIAL PUBLIC OFFERINGS: AN APPLICATION ON HEALTH INDUSTRY IN NYSE

DOI: 10.17261/Pressacademia.2019.1153

JEFA- V.6-ISS.4-2019(5)-p.230-235

Havane Tembelo

Istanbul Health Services Administration, Istanbul, Turkey.

[havane.tembelo@saglik.gov.tr](mailto:havane.tembelo@saglik.gov.tr) , ORCID: 0000-0003-3394-4166

Date Received: November 11, 2019

Date Accepted: December 20, 2019

### To cite this document

Tembelo, H. (2019). Short-term price-performance analysis of initial public offerings: an application on health industry in NYSE. Journal of Economics, Finance and Accounting (JEFA), V.6(4), p.230-235.

Permament link to this document: <http://doi.org/10.17261/Pressacademia.2019.1153>

Copyright: Published by PressAcademia and limited licenced re-use rights only.

### ABSTRACT

**Purpose** - The purpose of this study is to investigate short-term underpricing anomaly of IPOs in health industry firms in USA. This study tried to test short-term underpricing anomaly that suggests investors may able to get abnormal returns by purchasing stocks at issuance date and selling them after holding for short time period.

**Methodology** – Analysis period is taken into consideration as first 7 days after the issuance. To conduct analysis in the study, a sample, which includes 12 listed firms, is built. Stock returns are calculated from issuance date until 7th day. First raw returns are calculated based on price movements of each IPO and then abnormal returns are calculated by comparing them to NYSE index return. In order to get smoother series to reflect normal distribution features, compound abnormal returns are calculated.

**Findings** – Raw returns are positive but significant only on 5th day after issuance. Abnormal returns except for 2nd and 3rd day are positive but statistically significant only 5th day after issuance. Compound abnormal returns are positive except for 3rd day but similarly it is statistically significant on 5th day after issuance. Based on test results, an investor who purchased stocks at the issuance and hold them until 5th day would get higher return (abnormal return) by %0,71 and higher compound return (compound abnormal return) by %1,23 than market average.

**Conclusion** – According to results of t-test, it can claimed that underpricing anomaly can be confirmed for the firms are traded in health industry in NYSE.

**Keywords:** Price anomalies, underpricing anomaly, initial public offerings (IPO), t -test

**JEL Codes:** C23, G10, G32

### 1. INTRODUCTION

To maintain business operations firms need for financing. Money and capital markets are financial markets where firms can meet their financing needs according to their short and long term operations. While short-term financing needs can be met via money markets, long-term financing needs can be met from capital markets.

There are two types of funds in the form of debt and equity that can be obtained from the capital market by companies that need long-term funds, in particular investment. The acquiring new shareholders by selling shares to the public is called public offering and public offering is used as equity financing method in the capital market. While public offerings have advantages such as providing non-repayable funds and increasing popularity of firms, they also have some disadvantages, especially public offering costs. Before making this critical decision, firm management needs to address the advantages and disadvantages of public offering together.

Many studies have been conducted in the literature on public offerings. Most of the studies are related to short and long price performance of public offerings. In most of the studies performed in the literature, price abnormalities were observed in the short and long term after the public offering. In the short term after the public offering, it is generally seen that the prices increase excessively compared to the market average and thus investors may have abnormal returns in the short term. This is called a short term underpricing anomaly. In the long run, there is a long-term under-performance anomaly, which

suggests that the stock price performance of the firms that performed IPOs may have a relatively low price performance compared to index return and return of the similar firms that did not make the IPO.

The aim of this study is to contribute to the current literature and to test the short term underpricing anomaly of public offerings through firms operating in the health sector traded on the NYSE stock exchange.

In the second part of the study, the studies about the short term underpricing anomaly in the initial public offerings are examined in the literature. Section 3 provides information about the data and the sample, and provides methodological information on how the analysis is performed. In Chapter 4, raw, abnormal and compound abnormal return calculations are performed. In order to determine whether each return type is statistically significant, t test is performed and the results are analyzed by comparing with critical values. In the last part of the study, the hypotheses related to the short term underpricing anomaly in the initial public offerings are evaluated based on the findings.

## **2. LITERATURE REVIEW**

One of the most important explanations regarding the underpricing anomaly in the initial public offerings is the adverse selection model. Rock (1986) proposes the inverse selection model and classifies the investors as knowledgeable investors who want to buy stocks when the public offering is underpriced and as non-knowledgeable investors who want to buy stocks in all public offerings, regardless of stocks are underpriced or not. In the model, it is assumed that when the stocks have underpriced the allocation to the uninformed investor will be very low, even if the demand received from both informed and uninformed investors. On the other hand, if the IPO is overpriced, the uninformed investor will receive all issued shares and will suffer losses in the medium and long term. As a result; that allocation in these low and overpricing situations would reveal the problem known in the literature as the winner's curse.

Mc Donald and Fisher (1972) worked on 142 public offerings of more than \$ 1 Million, which sold a minimum of 150,000 shares in the first quarter of 1969, and found underpricing in public offerings that support the effective market hypothesis.

Logue (1973), examined the behavior of investment banks in the pricing process. He found out that if an investment bank made underpricing in the initial public offering, it would have minimized its costs and risk and would have provided higher returns to the investor especially in the short term. In summary, the main determinant of the underpricing in public offerings is that the investment bank aims to guarantee the success of the public offering by selling all the shares in the public offering thanks to discounting offering prices.

Ritter (1984), as a result of his analysis that includes 5,162 first public offerings made in the USA between 1960 and 1982 confirmed the underprice anomaly in the initial public offerings and the hot issuing cycle. He found out that the initial public offerings were underpriced by 18.8% in the short term. In his study, he calculated the return in the 1980 - 81 period which he defined as hot issuing offerings as 48.4% and the return for the period that he described as cold issuing offerings as 16.3%.

Loughran, Ritter, and Rydqvist (2015) in their study, analyzed the difference between short-term returns of public offerings in different locations in terms of binding regulations, contract mechanism and the characteristics of the public offering firm. They stated that attempts to reduce legal interventions in the process of determining the public offering price, especially in East Asian countries, resulted in a decreasing underpricing degree in the 90s compared to the 80s.

Bajo and Raimondo (2017) analyzed the relationship between the news that is published in the media about the company before the IPO and the IPO price performance. They examined 2184 initial public offerings and 27309 news articles in the USA between 1995 and 2013. According to the results of the analysis, they found a positive relationship between the positive news about the company prior to the initial public offering and the underpricing. Also they observed that this degree of the relationship is much stronger in the news published closely IPO date and in the news published in reputable newspapers.

Boulton et.al (2017), examined the effect of accounting conservatism applied by countries on underpricing anomaly observed in international IPOs. They tried to confirm the hypothesis that suggests conservatism reduces on underpricing anomaly by decreasing the information asymmetry level in the firms. Based on their findings based on 13285 IPOs from 36 countries, they found out that there is a negative relationship between more accounting conservatism of countries and underpricing anomaly.

Kotlar et.al (2018), tried to reconcile the conflicts between the theories about the low pricing anomaly seen in the initial public offerings made by family firms. They approach IPO pricing as a two-stage gamble. They assume that the initial socioemotional losses wealth required by the IPO decision is increasing the tendency of the owners of family firms to compensate for these losses. For this purpose, they adjusted a behavioral agency model with the aversion to loss realization

logic to state how the decision affects owners of family firms during the IPO based on initial losses for current socioemotional losses wealth and new expectations related to future socioemotional losses wealth.

Gandolfi et.al (2018), studied both short and long-term price anomalies observed in IPOs. As short-term anomaly they analyzed underpricing anomaly while for the long-term they used the underperformance anomaly. They conducted the analysis based on sample includes 437 IPOs in Europe for the 1997 – 2011. They examined three major countries in Europe includes Germany, France and Italy respectively. They also perform analysis according to industries. Based on their analysis results, they found out that there is no significant difference between countries in terms of short-term underpricing anomaly while they observed remarkable differences in long-run price performance. They also stated that industry type is not determining factor on both short and long-term price performance.

### 3. SAMPLE CONSTRUCTION AND METHODOLOGY

Data regarding stock prices of health industry firms that listed in NYSE are used. Historical stock price information are obtained from investing.com. In the NYSE, currently there are 12 health firms are being traded that's why our sample is based on these 12 firms. The summary information of the sample is provided in Table 1.

**Table 1: Summary Information of the Sample**

No	Company	Ticker	Avg. Marke Value - Millions	Avg. Return of 1 Year - %
1	HCA Healthcare, Inc.	HCA	48.700	7
2	Universal Health Services, Inc.	UHS	12.810	12
3	DaVita Inc.	DVA	9.380	25
4	Encompass Health Corporation	EHC	6.960	-4
5	Tenet Healthcare Corporation	THC	3.870	60
6	Select Medical Holdings Corporation	SEM	3.080	24
7	Mednax, Inc	MD	2.380	-27
8	Brookdale Senior Living Inc.	BKD	1.280	-18
9	Community Health Systems, Inc.	CYH	414	-24
10	American Renal Associates Holdings, Inc	ARA	335	-36
11	Genesis Healthcare, Inc.	GEN	267	-4
12	Capital Senior Living Corporation	CSU	113	-57

Since short-term analysis is being performed, the analysis period is taken into consideration as first 7 days in line with existing literature. First raw returns of stocks are calculated based on closing prices and then abnormal returns are calculated by comparing raw returns to return of NYSE index. Required formula to calculate raw returns are shown as follows.

$$R_{it} = \frac{(P_{it} - P_{it-1})}{P_{it-1}} \quad (1)$$

A description of the notations in the formula is given below:

$R_{it}$  : The return of stock called i for time t.

$P_{it}$  : Closing value of stock called i for time t.

$P_{it-1}$  : Closing value of stock called i for time t-1.

To calculate the abnormal return of stocks, the returns of the NYSE index are calculated as follows:

$$R_{mt} = \frac{(P_{mt} - P_{mt-1})}{P_{mt-1}} \quad (2)$$

A description of the notations in the formula is given below:

$R_{mt}$  : Return of the NYSE index for time t,

$P_{mt}$  : Closing value of NYSE index for time t,

$P_{mt-1}$  : Closing value of the NYSE index for time t-1.

We performed analysis under the buy and hold investment strategy. Therefore, we assumed that investors will not make daily trading instead they will hold stocks for a while and then sell. Abnormal returns are calculated based on following formula Asquith and Mullins (1986):

$$AR_{it} = R_{it} - R_{mt} \quad (3)$$

A description of the notations in the formula is given below.

$AR_{it}$  : Abnormal return of stock called i for time t,

$R_{it}$  : The raw return of stock called i for time t,

$R_{mt}$  : Market return for time t.

To see statistical properties of stock prices more clearly, in this study, average adjusted return and compounded adjusted return are calculated respectively. Required formulas are presented in Eq.4 and Eq.5 respectively.

Average abnormal return can be calculated based on following equation of Asquith and Mullins (1986).

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^n AR_{it} \quad (4)$$

To calculate compound abnormal return following equation developed by Wu and Kwork (2007) should be applied:

$$CAR_{(T_1, T_2)} = \left[ \prod_{t=T_1}^{T_2} (1 + R_{it}) \right] - \left[ \prod_{t=T_1}^{T_2} (1 + R_{mt}) \right] \quad (5)$$

We preferred to calculate compound abnormal return instead of cumulative abnormal return since compound abnormal return based on geometric average calculation and thus make series smoother by eliminating outlier values (Cikrikci and Ozyesil, 2018:210).

t statistics and critical values are calculated to find out whether abnormal returns are statistically significant or not. We built following hypothesis statements:

$H_0: \overline{AR}_t, \overline{CAR}_t \leq 0$  There is underpricing anomaly in stock prices of sample.

$H_1: \overline{AR}_t, \overline{CAR}_t > 0$  There is underpricing anomaly in stock prices of sample.

#### 4. FINDINGS

All calculations are made by using Excel 2016 and SPSS 22 program. Table 2 indicates stock returns for the first week after the issuance. When the raw returns are analyzed, it is seen that the raw returns are positive during the first week after the IPO but it is statistically significant only on the 5th day. On the 2nd and 4th days abnormal returns were negative but statistically insignificant. However, abnormal returns provide positive returns as of the 5th day as well as raw returns and these returns are statistically significant. According to this result, it can be concluded that if investors purchase shares from the issuance, hold them until the 5th day, and then sell, they will generate 0.71 higher returns compared to the market average. Similar results are observed in the compound abnormal returns. Except for 3rd day, compound abnormal returns are calculated as positive but found statistically significant only on the 5th day. Based on findings for compound returns, it is possible for the investor to generate 1.23% more returns than the market on the 5th day after issuance.

**Table 2: Short - Term Price Performances of Stocks**

Period	n	$\bar{R}$	t- ist.	$\bar{AR}$	t- ist.	<i>CompoundAR</i>	t- ist.
<b>First Day (t)</b>	12	0,61	0,22	0,41	0,08	0,47	0,25
<b>t+1</b>	12	0,37	0,35	-0,75	-0,27	0,36	0,38
<b>t+2</b>	12	0,26	0,09	0,41	0,23	-0,25	-0,54
<b>t+3</b>	12	0,87	0,32	-0,50	-0,10	0,57	0,76
<b>t+4</b>	12	0,73*	0,78	0,71*	1,12	1,23*	0,72
<b>t+5</b>	12	0,21	2,01	0,65	0,87	2,33	0,82
<b>t+6</b>	12	0,49	2,45	0,98	1,75	3,57	1,03

Note: n refers sample size. Critical values to test the t-statistics are used as 1,282, 1,645, 2,326 and related significance level for these values are %10, %5 and %1 respectively (Tari, 2012: 500).

## 5. CONCLUSION AND RECOMMENDATION

In this study, short - term stock price performance of 12 companies operating in the health sector in NYSE is analyzed. In the study, the short term is considered as the first 7 days after the public offering. In the analysis, it is assumed that investors follow the buy & hold strategy, which states that they buy the stock and keep it in the portfolio for 7 days, which is the analysis period. Firstly, the raw returns are calculated over the closing value of the stocks and then the abnormal returns and compound abnormal returns are calculated by comparing raw returns with NYSE returns.

According to the test results, if the investors sell their stocks as of the 5th day after the first issue, it is confirmed that they can obtain an over market return according to both abnormal return and compound abnormal return and the results are statistically significant. According to the results of the analysis, short-term underpricing anomaly in the health sector in NYSE is partially confirmed. Investors who are timing stock trading during the first week after the issuance may have higher returns than the market average.

In this study, macro and micro determinants of the stock price performance are not included in the analysis. In addition to macro parameters such as the macroeconomic conjuncture, by examining the micro parameters such as IPO ratio, IPO size, IPO method, brokerage firm type, and costs, the factors affecting the abnormal returns can be determined.

## REFERENCES

- Asquith, P., & Mullins, D. W. (1986). Equity Issues And Offering Dilution. *Journal of Financial Economics*, (15), 61 - 89.
- Bajo, E., Raimondo, C. (2017). Media Sentiment and IPO Underpricing, *Journal of Corporate Finance*, 46, 139-153.
- Boulton, T.J., Smart, S.B., Zutter, C. (2017). Conservatism and International IPO Underpricing, *Journal of International Business Studies*, 48(6), 763-785.
- Cikrikci, M, Ozyesil, M . (2018). Long Term Underperformance Anomaly and Its Dterminant Factors on Seasoned Equity Offerings: Evidence From Turkey. *Journal of Business Economics And Finance*, 7 (3), 208-227.
- Gandolfi, G., Regalli, M., Soana, M.G, Arcuri, M.C. (2018). Underpricing and Long-Term Performance of IPOS: Evidence from European Intermediary Oriented Markets, *Economic, Management and Financial Markets*, 3,11-36.
- Kotlar, J., Signori, A., Massis A.D., Vismara, S. (2018), Financial Wealth, Socioemotional Wealth, and IPO Underpricing in Family Frims: A Two – Stage Gamble Model, *Academy of Management Journal*, 61(3), 1-59.
- Logue, D.E. (1973). On The Pricing of Unseasoned Equity Issues: 1965-1969. *Journal of Financial and Quantitative Analysis*, 8 (1). 91 - 103.
- Loughran, T., Ritter, J. R., Rydqvist, K. (2015). Initial Public Offerings: International Insights. *Pacific - Basin Finance Journal*, (2). 165 - 199.
- Mcdonald, J, Fisher, A.K. (1972). New Issue Stock Price Behaviour. *Journal of Finance*, 27 (1). 97 - 102.
- Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions When Firms Have Information The Investors Do Not Have. *Journal of Financial Economics*, 13 (2). 187 – 221.
- Ritter, J. R. (1984). The Hot Issue Market of 1980. *Journal of Business*, 57 (2). 15 - 240
- Ritter, J. R. (1991) The Long - Run Performance of Initial Public Offerings. *Journal of Finance*, 46 (1), 3 - 27.

Rock, K. (1986). Why New Issues Are Underpriced. *Journal of Financial Economics*, (15). 187 - 212.

Tarı, R., (2012). *Ekonometri*. Kocaeli: Umuttepe Yayınları.

Welch, I. (1989). Seasoned Equity Offerings, Imitation Costs and The Underpricing of Initial Public Offerings. *The Journal of Finance*, 44 (2), 421 - 449.

Welch, I. (1992). Sequential Sales, Learning, and Cascades. *The Journal of Finance*, 47 ( 2). 695 – 732.

Wu, C., & Kwork, C. C. K. (2007). Long-Run Performance of Global Versus Domestic Initial Public Offerings. *Journal of Banking & Finance*, (31). 609 -627.