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Does Maturity Level of Newly Listed Firms Matter in the Long-Run Performance? Evidence from Pakistan

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ABSTRACT

In this study, the sample of newly IPO firms at PSX from 2000 to 2018 is selected to observe the performance in the long run, under different maturity level. The analysis is based on Jensen's alpha obtained through CAPM, four factors (4-F), and three factors model (3-F). Based on the analysis of Jensen's alpha, the underpricing of IPOs disappeared after the periods of one to three years to suggest that investors can not earn risk-adjusted positive returns accounting for market, momentum, value and size factors. In the analysis of GCT regression model, for the three different maturity level, the severe underperformance of these new firms are to be observed. Further, the result of new firms through GCT model show that different maturity (1-5 years, 6-10 years, and more than 10 years) of firms do not matter, and overall newly firms underperform in long run.

Keywords: IPO, Jensen's alpha, PSX, long-run, GCT, maturity

1. INTRODUCTION

The prior studies indicated that the IPO firm's stock does not perform well in the long run. In these studies, different factors were discussed for the underperformance of these newly listed firms. Besides the underperformance, however, underpricing of IPO firms have been reported as common characteristic prevailing amongst most of the countries. Due to this underpricing investor can earn a high initial excess return on the IPO investment. In South Asian countries, Sohail and Farhat (2018) used a new approach of the comparable firm and showed the underpricing of 66.52%.

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In Pakistan hundreds of IPOs derive in 1990s, that was the peak period of IPOs in Pakistan. However, during the study period, more than 120 IPOs were listed at PSX and firms has raised enormous capital through IPOs. Although, Pakistani IPOs market explored in the recent decade by different researchers like (Sohail, Raheman, Zakaria and Farhat 2018, Sohail and Farhat, 2018, Sohail & Anjum, 2016, Sohail & Raheman, 2010, Kiyani & Amjed, 2011, Rizwan & Khan, 2008, Sohail & Raheman, 2009, and Sohail & Nasr, 2007), they observed underpricing and underperformance at PSX.

In all these studies underpricing issues are discussed in detail, while mostly CARs and BHARs models are used to observe the newly listed firms in the long run. Therefore, this study will cover the gap to observe the long run performance in the context of single and multi-factor models, taking the account of maturity levels of these firms. In most of the earlier studies CARs, BHARs and CAPM are used to observe the long-run performance. The strong underperformance of IPO firms was testified by the studies of Shah (1995), Ritter (1991) and Jain & Kini (1994). In Greece, Gounopoulos et al. (2012) used 254 IPO firms and found underperformance of -16.12% after the period of three years. In the UK -14% underperformance is reported by Belghitar and Dixon (2012). Chi, WcWha, and Young (2010) have reported -27.81% underperformance in New Zealand. In the same line, Kooli and Surat (2004) envisaged the -20.70% underperformance of 445 IPO firms in Canada.

However, in contrast to the above studies, miss-specification of the model is also highlighted by some of the other studies. Chen et al. (2002) used and favored 3-F Fama French model by arguing that the return's patterns of the 3-F model are just like returns of financial assets. Instead, Barber and Lyon (1997) preferred BHARs. Whereas Fama (1998) favored the CARs model. As the literature on PSX with regard to long-run performance is deficient, the objectives of the present study include answering the question that how newly firms perform in the long run under different maturity level?

Mainly, the GCT regression model is applied to answer the above research questions. It is expected that the present study will contribute additional evidence of the performance of new firms in the longer run. Based on the results of this research, investors would be in a position to retain or to dispose of the shares, once they have

acquired these shares through IPOs. The results of the GCT regression model will help the investors whether to retain the shares of matured or less mature firms for a longer period or not?

2. LITERATURE REVIEW

The main issues in the field of IPOs like underwriter's role, underpricing, risk, long-run performance, corporate governance, and most newly efficiency matters of IPOs were analyzed. In the prior studies, several factors were discussed for underpricing and long-run underperformance of IPOs. Chambers & Dimson (2008) examined the mean abnormal returns of 0.11 during the study period of 1917-2007. They used 90-years data of IPO firms. For the long run performance of IPOs in the USA, Brau (2012) reported -17.1% of underperformance after the period of 36 months. He used a very large IPO firms' data of 3547 from 1985 to 2003. Eckbo and Norli (2005) also examined the underperformance in the USA and reported some determinants like low leverage ratios and high stock turnover for bad performance. In all these studies BAHRS methodology is used.

Khan et al. (2018) investigated the features of IPO's long-run performance in Pakistan. Their results showed that Pakistani IPOs have been underperformed in the long-run based on both EW and VW schemes, firms which are bigger perform well as compared to smaller firms. They used the firm's cross-sectional data covering the period from 2000 to 2015 and conducted regression analysis. Long-run performance of IPO's is determined by three estimators; multivariate OLS model, binary Logit and Probit model. The Dependent Variable they used was BHAR while independent variables were Firm-Level Initial return (IR) index, Size of the firm dummy variable was Underwriter reputation where the variable value of "1" (Urep) specifies prestigious underwriter and zero value showed non-prestigious underwrite.

Mulchandani (2018) conducted a study on the Indian stock market to inspect IPOs performance at the day of listing and aftermarket IPOs performance. The author scrutinized pricing and long run performance. For this purpose, Mulchandani (2018) collected secondary data from the National Stock Exchange of India covering data of

IPO's and FPO's from 2001 to 2017 which includes 375 listed IPOs and 9 FPOs. Hoechle et al. (2018) conducted this study to examine how an IPO performs over varying time horizons ranging from 1-40 quarters. The authors used a Carhart (1997) four-factor model with Newey-West standard errors and equal-weighted observations, while in robustness tests; they used market model. Independent variables of the study were based on a Kronecker product of the risk factors RMRF, SMB, HML and MOM and a set of firm characteristics.

Hoechle et al. (2018) empirically found that no IPO underperformance in the largest quartile, quintile, and decile of firms using either equal- or value-weighting. They considered that larger and well-performing IPO firms which are less in numbers are answerable for the absence of any underperformance in value-weighted portfolios. Hawaldar et al. (2018) developed this research to explore IPOs performance in long run in Pakistan from 2006 to 2011. The researchers used the Regression Analysis technique in which the dependent variable was Stock returns of IPO firms while, independent variables were firm size, firm age, and profitability and leverage ratios. Hawaldar. et al. (2018) argued that there exists a significant positive correlation of the firm's size and profitability with the IPOs performance in the long run. Leverage and firm age were found to be inversely interrelated with IPOs performance in the long run.

Dhamija & Arora (2017) analyzed IPOs performance at the day of its listing, post-listing aftermarket IPOs performance of Indian stock market. They investigated 464 Indian IPOs performance from the year 2001 and 201. The researchers used the cumulative average abnormal return (CAAR) technique for estimation of the performance of IPO in the long run. Dhamija & Arora (2017) reported the inverse correlation between book-built cumulative average abnormal returns (CAARs), while after one and one-half year; this negative correlation turned into positive and continues to be positive thereafter.

Mumtaz & Ahmed (2017) analyzed the performance of Indian IPOs in the long run and to find factors of long-run performance. The research included 377 (IPOs) by Indian companies covering the period of 2005–2015. They used initial excess returns (IERS) to check initial underpricing. They measured long-run performance by using cumulative average abnormal return (CAR), 3-year buy-and-hold return (BHR) and

wealth relatives (WR). Their outcomes demonstrated that the Indian IPOs outperform the broad market in the long run. The IPOs showed 22% initial excess returns (IERs). However, 37 percent of the IPOs revealed negative IERs. The IPOs underperformed generating buy-and-hold abnormal returns (BHAR) over 3 years afterward they listed.

Sohail, Bilal, Rukh, & Fatima (2018) conducted this study which is related to underpricing of twenty-six corporations listed on Pakistan Stock Exchange (PSX) covering the period from 2010-2015. The study considered initial public offerings (IPOs) with its long run performance yearly. They considered underpricing as the dependent variable and while market capitalization and market were taken as independent variables. They used Multiple Regression Analysis to check the influence of independent variables on the dependable variable. The researchers argued that both IV's market volatility and market capitalization have a significantly positive impact on underpricing. The ex-ante has an inverse insignificant relationship with underpricing. Cumulative Abnormal Return (CAR) and Buy and Hold Return (BHAR) was used to measure the Long run performance of IPOs was calculated. Financial history of IPO companies is very short i.e. there is a strong impact of earnings on the IPO pricing.

Lizińska, & Czapiewski L. (2018) developed this study on Poland IPO companies which were related to observing the Long-term IPO abnormal performance. They measured IPO abnormal performance for the long run by using the buy-and-hold approach. The outcomes proposed that those IPO companies practiced poorer abnormal long-term market performance which managed earnings more aggressively. The study of Kamaludin & Zakaria (2018) covered the period from January 1st, 2000 -August 31st, 2017. They selected 45 IPO companies. Event time approach has been used in this study. For short-run share performance, Market-adjusted initial returns have been used in this research to find the abnormal returns. While for performance in long-run, they used buy-and-hold abnormal returns (BHAR).

AlShiab (2018) examined Initial Public Offerings (IPO's) of 162 the Middle East and North Africa (MENA) during 2001- 2015. The authors categorize the results into 3 groups. Those countries are included in the 1st group, where IPOs underperformed the Standard portfolio in long-run but over-performed in short-run. Those countries are

included in the 2nd group in which IPOs underperformed over 5 years after it's listed and. Those countries are included in the 3rd group in which IPOs showed repeated performance changes from under-performance to over- performance and vice versa.

Satta et al. (2017) analyzed that what would be the IPOs performance in long-term in the seaport. For evaluation of factors, this study used the following theories which include places institutional theory, informational asymmetry theories, and symmetric information theories. To check the long-term performance of port-related IPOs, the authors used OLS regression analysis which covers around 90 port-related IPOs. The IPOs performance influenced the aptitude of ports and firms.

Chemmanur & Yan (2017)) showed that firms which are going public prior to their IPOs are correlated with price revisions. They also showed minor stock returns for the long-run. In the different markets of the globe, contentious results are to be observed due to adoption variety of models for the underperformance of newly listed firms. That can be seen from the studies of Ritter (1991), Loughran (1993).

Levis (1990), Espenlaub et al. (2000) and Goergen et al. (2007) showed underperformance of IPOs in the UK. Likewise, in Germany, Ljungqvist (1997) and Bessler & Thies (2007) also found underperformance of IPOs. All these studies show different underperformance results due to the different choice of models. The developing countries have been also witnessed this underperformance of IPOs. In China Brookfield (2011) and Su, Bangassa reported the misspecification of the model. MacGuinness (1993) observed -18.3% of underperformance in Hong Kong by using the sample of 72 firms.

To observe the long run underperformance of IPOs, Ritter and Welch (2002) used two different benchmarks and reported the contentious results. They used market and matched firms as benchmarks to calculate the abnormal returns. They reported -23.4% abnormal returns under market as the benchmark, whereas -5.1% abnormal returns under matched firm as benchmark after the period of three years. In a net shell, they validated the misspecification of models. In the study of Eckbo and Norli (2005), the underperformance of IPOs was not confirmed accounting for different risk factors under 3-F model as he reported insignificant Jensen's alpha. In contrast to Eckbo and Norli

(2005) study, Gompers and Lerner (2003) showed underperformance of IPOs by using the same model of 3-F for the longer period of 1936-76.

Different results of underperformance were observed due to the use of different models. To observe the underperformance of IPOs, Barber and Lyon (1997) applied two different methodologies CARs and BHARs and reported different results and raised questions for the methodology used. They supported the skewness adjusted model to tackle the skewness problems in the data of IPOs. Chen et al. (2002) used and favored 3-F Fama French model by arguing that the return's patterns of the 3-F model are just like returns of financial assets. Brav (2000) criticized 3-F model by arguing that abnormal returns calculated by 3-F model do not follow the normality and independence assumptions.

3. RESEARCH METHODOLOGY

From the population of IPOs, during the year 2000-2018, the sample of those IPO firms is selected that were from the year 2000 to 2014, to cover the after performance of three years. Therefore, those IPO firms were included which will cover a period of at least 3 years. After this filtering process, the final sample of 67 IPOs is examined. For long run analysis, Jensen's alpha is observed by using the following regression models.

$$Er_NF_{it} = J_alpha_t + \beta_t M_{kt_F_{it}} + \epsilon_{it} \quad (1)$$

$$Er_NF_{it} = J_alpha_t + \beta_t M_{kt_F_{it}} + \beta_t Sz_F_{it} + \beta_t Val_F_{it} + \epsilon_{it} \quad (2)$$

$$Er_NF_{it} = J_alpha_t + \beta_t M_{kt_F_{it}} + \beta_t Sz_F_{it} + \beta_t Val_F_{it} + \beta_t Mom_F_{it} + \epsilon_{it} \quad (3)$$

Where, J_alpha_t is the Jensen's alpha(s) obtained through regression models in different time periods for each IPO firm (Months: 12, 18, 24, 30 & 36). Er_NF_{it} is the excess return of new firms, the i.e return of newly firms minus the risk-free rate. M_{kt_F} is the market factor calculated as Index return minus risk-free rate. Sz_F is the size factor of 3-F model, while Val_F is the value factor of 3-F model, whereas Mom_F is the momentum factor of 4-F Carhart's model¹. Based on these models, The Jensen's alpha is obtained through running more than 1500 regressions. The program was written in Eviews. The Hypotheses, "The long-run performance of new firms in different time

¹ The detail calculation can be seen in Sohail, Raheman, Zakaria and Farhat (2018)

horizons is different from zero” is tested. To observe the performance of new firms in the category of less matured and matured, Hoechle & Schmid (2008) “model of Generalized Calendar Time (GCT) Portfolio Analysis” is used.

$$y_{it} = ((p_{it} \otimes z_{it}) \otimes x_t) \beta + u_{it} \quad (4)$$

Where vector β represents coefficients of regression, the risk-adjusted performance of new firms is obtained by vector x_t as:

$$x_t = [1, R_{Mt}, SMB_t, HML_t, MOM_t] \quad (5)$$

X_{it} is simply 4-F Carhart’s model. While z_{it} and p_{it} represent different characteristics of new firms of Hoechle & Schmid (2008) model, i.e. liquidity, firm valuation, and leverage etc., used for z_{it} in that model, however, in this study these characteristics are not taken and it is set to 1. However, the p_{it} is a constant and a dummy variable (DT_{it}), In this study 1 is for newly firm occurred within the last T years, and 0, otherwise: T can take 1, 2 and 3. i.e. three different definitions for new firm’s dummy (DT_{it}).

$$p_{it} = [1, DT_{it}] \quad (6)$$

The final model will get the following form:

$$y_{it} = ((p_{it} \otimes z_{it}) \otimes x_t) \beta + u_{it}$$

$$y_{it} = (([1, DT_{it}] \otimes 1) \otimes [1, M_{kt_Fit}, Sz_Fit, Val_Fit, Mom_Fit]) \beta + u_{it}$$

After year 1, $DT_i=1$

$$y_{it} = (([1, 1] \otimes 1) \otimes [1, M_{kt_Fit}, Sz_Fit, Val_Fit, Mom_Fit]) \beta + u_{it}$$

$$y_{it} = [1, M_{kt_Fit}, Sz_Fit, Val_Fit, Mom_Fit] \beta + u_{it}$$

The above model is same as discussed previously. Therefore, GCT approach under Hoechle & Schmid (2008) study is a step ahead to observe the long run performance of newly firms after the period of 1, 2, and 3 years. By incorporating different definitions, the model final form is:

$$y_{it} = (([1, DT_{it}] \otimes 1) \otimes [1, M_{kt_Fit}, Sz_Fit, Val_Fit, Mom_Fit]) \beta + u_{it} \quad (7)$$

$$\begin{aligned} \text{That is: } y_{it} = & \beta_0 + \beta_5 \times DT_{it} + \beta_1 \times M_{kt_Fit} + \beta_6 \times (DT_{it} \times M_{kt_Fit}) \\ & + \beta_2 \times Sz_Fit + \beta_7 \times (DT_{it} \times Sz_Fit) + \beta_3 \times Val_Fit + \beta_8 \times (DT_{it} \times Val_Fit) + \beta_4 \times \\ & Mom_Fit + \beta_9 \times (DT_{it} \times Mom_Fit) + u_{it} \end{aligned} \quad (8)$$

The Hypotheses, “The long-run performance of newly firms of matured and less matured firms in different time horizons is different from zero” is tested.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis

On average 0.41% raw return, while -0.811% median return with the variability of 17.55% of newly listed firms is to be observed. The lowest returns remain at -0.68 while 2.69 is the maximum return. The descriptive statistic of different factors like the median of momentum and market factors is observed to be positive and the median of value and size factor has shown negative figures.

4.2. Long-run performance of newly firms

From the results of the first three regression models, in different time horizons, the underperformance of new firms is observed. Although, the intercept term, Jensen's alpha showing the negative sign but insignificant. However, the intercept term under model 4-F-Val after the period of one year is showing positive sign but insignificant. These results of regression models are placed on table 1. The 3-F and 4-F models are employed both in equally and value-weighted form i.e. these models are extended to 5 models.

These results of underperformance of IPOs in PSX, confirm the controversial results and validate the study of Eckbo & Norli (2005) and Ritter and Welch (2002) where Jensen's alpha was insignificant. They confirmed that underperform of IPOs remain insignificant when accounting for different risk factors under the 3-F model. The amount of Jensen's alpha in the monthly analysis after the period of three years was observed to be -1.0%, -1.2%, -1.1%, -1.0%, and -1.0% in all the five models respectively. The same results are also witnessed in the weekly and fortnightly analysis in different time horizons, but not presented in this study. One interesting observation is the amount of underperformance is observed higher in 3-F and CAPM as compared with 4-F Carhart's model.

On the other hand, betas are observed to be significant in all the models under different time horizons showing market effects are significant in CAPM, 3-F and 4-F models. Overall the downward tendency of betas is to be observed at different time intervals in all the models

Table 4.1: Long run performance of newly firms under different models

	Year 1		Year 1 & ½		Year 2		Year 2 & ½		Year 3	
	C	t stat	C	t stat	C	t stat	C	t stat	C	t stat
CAPM										
Alpha	-0.011	-0.820	-0.012	-0.730	-0.010	-0.590	-0.012	-0.670	-0.011	-0.720
Beta	1.063	3.320	0.981	3.470	0.962	3.440	0.950***	3.901	0.962***	4.016
r ²	0.339		0.329		0.298		0.298		0.302	
Adj. r ²	0.273		0.287		0.266		0.273		0.282	
3-F-Eql										
Alpha	-0.003	-0.599	-0.011	-0.630	-0.010	-0.580	-0.011	-0.688	-0.012	-0.755
Beta	1.041	3.321	0.967	3.624	0.958	3.357	0.964***	3.778	0.969***	3.948
S	-0.037	-0.198	-0.052	-0.208	0.043	-0.189	0.077	-0.037	0.105	-0.021
H	-0.321	-0.405	-0.272	-0.353	-0.205	-0.238	-0.256	-0.340	-0.238	-0.340
R ²	0.467		0.407		0.362		0.348		0.342	
Adj. R ²	0.268		0.280		0.266		0.273		0.281	
3-F-Val										
Alpha	-0.006	-0.749	-0.011	-0.708	-0.008	-0.561	-0.009	-0.666	-0.011	-0.732
Beta	1.050	3.218	0.967	3.614	0.952	3.363	0.948***	3.793	0.958***	3.918
S	-0.011	-0.472	0.029	-0.222	0.058	-0.184	0.052	-0.061	0.063	-0.023
H	-0.143	-0.310	-0.131	-0.295	-0.090	-0.235	-0.175	-0.354	-0.182	-0.383
R ²	0.460		0.403		0.357		0.347		0.340	
Adj. R ²	0.258		0.276		0.260		0.272		0.278	
4-F-Eql										
Alpha	-0.003	-0.153	-0.010	-0.386	-0.009	-0.384	-0.008	-0.472	-0.010	-0.571
Beta	1.089	2.886	0.982	3.438	0.976	3.305	0.979***	3.746	0.975***	3.940
S	0.263	-0.185	0.032	-0.221	0.076	-0.164	0.126	-0.013	0.136	-0.018
H	-0.532	-0.318	-0.338	-0.253	-0.232	-0.136	-0.231	-0.206	-0.194	-0.219
M	-0.009	-0.391	0.024	-0.191	0.036	-0.247	-0.023	-0.332	-0.038	-0.214
R ²	0.537		0.449		0.401		0.378		0.364	
Adj. R ²	0.272		0.280		0.275		0.279		0.282	
4-F-Val										
Alpha	0.001	-0.152	-0.009	-0.445	-0.007	-0.310	-0.006	-0.416	-0.010	-0.574
Beta	1.080	2.501	0.988	3.403	0.97***	3.255	0.966***	3.737	0.966***	3.914
S	0.087	-0.445	0.070	-0.103	0.077	-0.132	0.077	-0.036	0.082	-0.043
H	-0.323	-0.247	-0.195	-0.251	-0.144	-0.192	-0.183	-0.305	-0.173	-0.317
M	-0.134	-0.540	-0.049	-0.377	-0.020	-0.392	-0.065	-0.445	-0.063	-0.287
R ²	0.526		0.446		0.400		0.377		0.363	
Adj. R ²	0.255		0.276		0.273		0.277		0.280	

(*p<0.01, **p<0.05 & ***p<0.010, C for coefficient)

While analyzing the co-movements of the new firm's portfolios with that of size factor under 3-F and 4-F models, no co-movements is observed and remain insignificant. That is the larger and smaller firms' portfolio under 3-F and 4-F models show no co-movement with newly firms' portfolios. These results validating the results of other studies; Saleh and Ahmad (2008), Brave and Gompers (1997) etc. Further, the sign of size factor remains mixed under different time horizons showing some inconsistent results.

In the same way, while analyzing the co-movements of new firm's portfolios with that of value factor under 3-F and 4-F models, again, no such co-movements is observed and remain insignificant. That is growth and value firms' portfolio under 3-F and 4-F models show no co-movement with newly firms' portfolios. However, the sign of size factor remains negative under different time horizons. These results also validating the results other studies; Saleh and Ahmad (2008), Brave and Gompers (1997) etc. Further, while analyzing the co-movements of the new firm's portfolios with that of momentum factor under Carhart's model, no co-movement is observed. That is loser and winner firms' portfolio under 4-F model shows no co-movement with newly firms' portfolios. However, the sign of momentum factor is observed to be negative under different time horizons. These results of momentum factors also validating the results other studies; Saleh and Ahmad (2008), Brave and Gompers (1997) etc.

4.3. Long run performance of newly firms under a different level of maturity

In this study, the new firms are divided into three different categories to observe risk-adjusted performance in the long run. These categories are made according to the age of new firms and termed as the level of maturity. In the methodology part, DTit dummy variables are used taking the value of 1, 2, and 3 to represent these levels of maturities; maturity-1, maturity-2, and maturity-3.

The value of t equal to one is depiction for maturity level 1, that is the new firm age is up to 5 years that went public through IPOs. This definition is named as maturity-1. The value of t equal to two is depiction for maturity level 2, that is the new firm age is up to 6 to 10 years that went public through IPOs. This definition is named as maturity-2. Lastly, the value of t equal to three is depiction for maturity level 3, that is the new firm

age is greater than 15 years that went public through IPOs. This definition is named as maturity-3. Here, the modified model of Hoechle & Schmid (2008) is used the one without firm characteristics and the second, standard errors of HAV-Newey test are taken instead of the standard error of Driscoll and Karay.

Table 4.2: The results of maturity-1 newly firms under GCT model

V	C	SE	t	P
j-alpha*	-0.01255	0.009032	-3.19003	0.00621
Mkt_F*	0.98555	0.08929	11.61794	0.00482
Sz_F	-0.00767	0.125532	-0.09883	0.92221
Val_F***	-0.24517	0.139053	-1.85798	0.06742
Mom_F	-0.01414	0.110868	-0.17417	0.86271
D5	0.008078	0.011705	0.476427	0.64212
D5*Mkt_F	-0.00414	0.122427	-0.07154	0.94393
D5*Sz_F***	0.295628	0.182952	1.637459	0.10125
D5*Val_F	0.12343	0.181166	0.677401	0.50614
D5*Mom_F	0.018792	0.139104	0.108752	0.92205
R ²	0.248663	N	2196	
R ² (adj.)	0.245549	F	78.32173	
SE	0.165117	P	0	

(*p<0.01, **p<0.05 & ***p<0.010, C for coefficient, V for variables, SE for Standard Error)

The result under maturity-1 of new firms through GCT model are displayed in table 2. The value of J-alpha is observed to be -01.126%, and significant, envisaging significant underperformance of new firms in the long run after the listing period of 3 years. This underperformance has taken the account of four risk factors; momentum, value, size, and market.

Here, D5 (dummy variable) is interacted with different risk factors, to observe the underperformance of newly firms at 1st maturity. The additional risk factors of newly firms at 1st maturity is represented by D5*Mkt_F, D5*Sz_F, D5*Val_F, and D5*Mom_F, to observe, how the underperformance of newly firms at 1st maturity differ from overall newly firms after the period of three years. In these analyses, the values of D5, D10, and D15 are more imperative to be noticed. If the value of D5 is found to be negative and significant, then it would be concluded that the new firms at 1st maturity, worst

underperform than overall newly firms in the long run. Nevertheless, D5 is observed to be insignificant. So, these results envisage that the new firms at 1st maturity did not worst perform than the overall newly firms in the long run. Further, other risk factors remain unchanged except the Size factor under GCT model.

Table 4.3: The results of maturity-2 newly firms under GCT model

<i>V</i>	<i>C</i>	<i>SE</i>	<i>t</i>	<i>P</i>
j-alpha	-0.00494*	0.013373	-3.04873	0.008986
Mkt_F	1.039696*	0.070421	16.94629	0.007953
Sz_F	0.143006	0.110505	1.331701	0.205894
Val_F	-0.11677	0.094605	-1.47703	0.152317
Mom_F	0.024212	0.076953	0.226531	0.845669
D10	0.006821	0.018543	-0.30142	0.772609
D10*Mkt_F	-0.27809***	0.165975	-1.83018	0.085455
D10*Sz_F	0.015125	0.229399	0.034733	0.992583
D10*Val_F	-0.23568	0.251178	-1.00573	0.324156
D10*Mom_F	-0.07255	0.222891	-0.37554	0.71604
R ²	0.256851	N	2196	
R ² (adj.)	0.253752	F	79.78932	
SE	0.169513	P	0	

(*p<0.01, **p<.05 & ***p<.010, C for coefficient, V for variables, SE for Standard Error)

The result under maturity-2 of new firms through GCT model are displayed in table 3. The value of J-alpha is observed to be -0.494%, and significant, envisaging significant underperformance of new firms in the long run after the listing period of 3 years. This underperformance has taken the account of four risk factors; momentum, value, size, and market.

As in the first analysis, here, D10 (dummy variable) is interacted with different risk factors, to observe the underperformance of newly firms at maturity-2. The additional risk factors of newly firms at maturity-2 are represented by D10*Mkt_F, D10*Sz_F, D10*Val_F, and D10*Mom_F, to observe, how the underperformance of newly firms at 2nd maturity differ from overall newly firms after the period of three years. Here, D10 is observed to be insignificant. So, these results envisage that the new firms at 2nd maturity did not worst perform than the overall newly firms in the long run.

Further, other risk factors remain unchanged except the Size factor under GCT model.

Table 4.4: The results of maturity-3 newly firms under GCT model				
V	C	SE	T	P
j-alpha	-0.00999**	0.005826	-2.4331	0.023746
Mkt_F	0.909782*	0.074472	12.40494	0.00378
Sz_F	0.24954**	0.110898	2.265333	0.027059
Val_F	-0.20157***	0.108933	-1.88151	0.069569
Mom_F	-0.03158	0.08435	-0.39338	0.699053
D15	-0.00154	0.007571	-0.43329	0.665255
D15*Mkt_F	0.218862***	0.120683	1.823086	0.078141
D15*Sz_F	-0.37531**	0.180036	-2.10452	0.046042
D15*Val_F	0.108762	0.16721	0.649103	0.526626
D15*Mom_F	0.07393	0.140813	0.522089	0.607778
R ²	0.247845	N	2196	
R ² (adj.)	0.244743	F	79.51214	
SE	0.161202	P	0	

(*p<0.01, **p<0.05 & ***p<0.010, C for coefficient, V for variables, SE for Standard Error)

The result under maturity-3 of new firms through GCT model are displayed in table 4. The value of J-alpha is observed to be -0.999%, and significant, envisaging significant underperformance of new firms in the long run after the listing period of 3 years. This underperformance has taken the account of four risk factors; momentum, value, size, and market.

As in the first and second analysis, here, D15 (dummy variable) is interacted with different risk factors, to observe the underperformance of newly firms at maturity-3. The additional risk factors of newly firms at maturity-3 are represented by D15*Mkt_F, D15*Sz_F, D15*Val_F, and D15*Mom_F, to observe, how the underperformance of newly firms at 3rd maturity differ from overall newly firms after the period of three years. Here, D15 is observed to be insignificant. So, these results envisage that the new firms at 3rd maturity did not worst perform than the overall newly firms in the long run. Further, other risk factors remain unchanged except the market and size factors under GCT model.

The result of new firms through GCT model under three maturity dimensions, the value of J-alpha is observed to be negative and significant, envisaging significant underperformance of new firms in long run after the listing period of 3 years. Further, the result of new firms through GCT model show that different maturity (1-5 years, 6-10 years, and more than 10 years) of firms do not matter, and overall newly firms underperform in long run.

5. CONCLUSION

It is observed that newly listed firms do not endure their initial returns on the first trading day after the listing as a result, investors earn negative risk-adjusted returns in the long run. The results of Jensen's alpha show negative but insignificant under three models. While analyzing the co-movements of new firm's portfolios with that of size factor, value factor and momentum factors, no co-movements is observed in the larger and smaller firms' portfolio, value and growth firms' portfolios (under 3-F and 4-F models) and winner and loser firms' portfolios (under 4-F model) with newly firms' portfolios. These results validating the results of other studies.

The result of new firms through GCT model under three maturity dimensions, the value of J-alpha is observed to be negative and significant, envisaging significant underperformance of new firms in long run after the listing period of 3 years. Further, the result of new firms through GCT model show that different maturity (1-5 years, 6-10 years, and more than 10 years) of firms do not matter, and overall newly firms underperform in long run.

These results are in accordance with the earlier studies conducted across globally to indicate that newly listed firms at PSX do not endure their initial returns and investors earn negative risk-adjusted returns in the long run.

It is suggested for new firms to improve their performance while for investors it is suggested that do not hold the shares of new firms for a longer period of one to three years, even the matured firms.

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