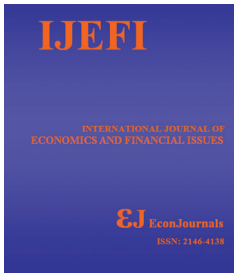

International Journal of Economics and Financial Issues

ISSN: 2146-4138

available at http: www.econjournals.com

International Journal of Economics and Financial Issues, 2024, 14(4), 172-177.

Investigating Overreaction and Underreaction in Initial Public Offerings

Samuel Tabot Enow

The IIE Vega school, 444 Jan Smuts Ave, Bordeaux, Randburg, 2194, South Africa. Email: enowtabot@gmail.com

Received: 15 February 2024 **Accepted:** 05 June 2024 **DOI:** https://doi.org/10.32479/ijefi.16199

ABSTRACT

Investors often overreact and underreact to new information in stock markets which has an exaggerated effect on the stock price. This has led to possible mispricing of Initial public offering. The aim of this study was to investigate overreaction and underreaction for selected stocks in the Frankfurt stock exchange. This study employed a Threshold GARCH model on a sample of eight initial public offerings from 2017. The findings of this study revealed the presence of overreaction and underreaction in the selected stocks where the leverage coefficients were found to be statistically significant in some cases. These findings provide valuable insights as the high risk of investing in initial public offerings may not be compensated for the level of return. Also, investors can minimise the risk of investing in initial public offerings by adding a risk coefficient to their pricing.

Keywords: Overreaction; Underreaction; Initial Public Offering; TGARCH.
JEL Classifications: G1, G2, G4

1. INTRODUCTION

The concept of market anomalies involves blending behavioural and cognitive psychology on the backdrop that investors are often limited in their capacity to make rational decisions (Naveed and Taib, 2021). Market anomalies such as underreaction and overreaction involves insights to behavioural psychology to gain understanding in the manner in which investors make decisions (Fromlet, 2001). In other words, investors are often limited on how to optimise investments decisions due to irrationalities and therefore, the price of a security may be determined without considering all available information. Also, the basic assumption of market efficiency is challenged by the concept of overreaction and underreaction where it attempts to explain market conditions that cannot be explained by traditional finance (Mahesh, 2016). In understanding this short coming that emanates from overreaction and underreaction, an investor will minimise cognitive and behavioural biases that are present in humans. In most cases, investors do not have all the relevant information necessary to make informed decision about the price of a security nor do they understand them even when presented with it. In essence, a lack of information or understanding thereof, may trigger market anomalies causing investors to overreact or underreact to new information. It may be therefore possible that Initial Public Offerings (IPOs) are not appropriately priced when they are listed in an exchange and experience a change in market price which is not proportionate to the fundamental value due to overreaction and underreaction which may further lead investors to trade more frequently or less than the norm rather than prudently. By implication, investors or market participants may be informationally disadvantaged and may disregard the fact that their own information and knowledge are biased (Merli and Roger, 2013). These biases are driven by investor's emotions and psychology rather than an understanding of the expected fundamental values that are used to value the security.

It is also widely accepted that there is a positive relationship between expected return and risk implying the greater the risk the more returns are expected (Gitman and Zutter, 2012;

Reilly and Brown, 2003). However, the presence of market anomalies such as overreaction and underreaction defies the risk and reward principle if present and the payoffs don't appear to compensate for risk. This is, the returns are not correlated with the exposures of the known risk factors. This adverse behavioural tendency is perceived to be prevalent in IPOs which come with the heighten excitement of going public for the first time. This idea is also supported by Chandra (2016) who contends that any new information may significantly alter the equilibrium price. In this case, information cascades on IPOs may cause market participants to overreact or underreact (Hirshleifer, 2003). The study of De Bondt and Thaler (1985) also suggest that overreaction and underreaction are caused by information asymmetry. Hong and Stein (1999) contend that overreaction which is a form of behavioural bias is caused by overconfidence where investors tend to ascribe their performance to their own abilities rather than empirical analysis. Therefore, the research question to be investigated in this study is, "does the volatility of IPO returns suggest the presence of overreaction and underreaction? In exploring this research question, this study makes a noteworthy contribution to literature of overreaction and underreaction in finance. The section below highlights the theoretical underpinning.

2. LITERATURE

The first IPO was introduced by the deutsche since then, a lot of private firms have identified IPOs as a reliable means of soliciting funding although they have also seen different trends in prices from the first day of listing. However, during the financial crises in 2008, very few private firms went public for new listings (Van Heerden and Alagidede, 2013). Post the financial crises, a lot of IPOs have embraced the Unicorn status were private firms have to meet the $1 billion valuation (Keith et al., 2015). As documented in prior literature, IPOs are characterised by oscillating returns especially during the first day of trading in which some investors take the advantage to benefit from the issue price that is lower than opening day trading price (Agostinetto, 2018). As in the case of VISA IPO in 2008, the opening price of the stock was $44 which had a significant increase of 28% to $56 by the end of the day (Benner, 2008). This price run extended till the end of the month where it was trading at $70 (Benner, 2008). A similar experience was the IPO issue of Ocado pls which had an initial offer price of 180 pence (180p), this was substantially decreased to 164p by the end of the day (Potter, 2010). The table below highlights a sample price changes in some IPOs listed in the US market from 2018-2021.

Table 1 above indicates that overreaction and underreaction in IPOs may be present because of Information asymmetry, winner's curse hypothesis and Bandwagon effect. The winner's curse hypothesis explains the buying psychology associated with unrealistic prices due to information asymmetry (Gunnelin, 2019). The winner's curse proposes that informed traders which are considered sophisticated investors will tend to profit from underpriced IPOs at the expense of uninformed traders commonly known as unsophisticated investors (Maggio and Pagano, 2014). In this case, uninformed traders will eventually withdraw from participating in the market because of negative returns. The bandwagon effect creates popularity or excess demand, and Investors adopt this behaviour because other investors are doing likewise. Investors feel they are doing the right thing when they behave like others although there may be no reason for trading. The outcome may not be based on technical or fundamental analysis but simply patterns in the market which drives the asset prices away from their fundamental values.

2.1. Mechanism of IPOs

IPOs comes into existence when a private firm offers its shares to the public for the first time. Prior to going public, the firm will have a small number of shareholders such as venture capitalist and private shareholders. Most often, when the firm reaches a growth stage of $1 billion which is referred to as Unicorn status it will most likely consider going public (Fernando, 2021). Not limited to the $1 billion valuation, private firms with good valuation and consistent profits may also consider an IPO (Fernando, 2021). The IPO proceedings consist of two phases which are the premarketing phase and the actual public offering (Fernando, 2021). Underwriters usually advertise the private firm's intention to go public by soliciting bids or making a public statement to arouse interest from the public where one or more underwriters may be selected by the private firm to lead the IPO proceedings. The value creation of the IPO stock is mainly from the difference in valuation between the private and public markets. The private market values the security based on the net fortune where anticipated forecasted cash flows or future estimates are not included in the model. All the valuation variables are based on cost of acquisition, cost of accounting or intrinsic values. However, the public market values the IPO stock base on anticipations such as equivalent interest rates. This implies that if the capital market requires 25% and the

Table 1: Price volatility of selected IPOs in the United States

Name of IPO	Listing date	Opening price	Closing price	Return on day 1
Spotify Technology	03/04/18	$165.90	$149.01	−10.2%
Watford Holding	28/03/19	$25.26	$27.00	6.9%
Stack	20/06/19	$38.50	$38.62	0.3%
Asana	30/09/20	$27.00	$28.80	6.7%
Palantir Technology	30/09/20	$10.00	$9.50	−5.0%
Thry Holdings	01/10/20	$14.00	$11.08	−20.9%
Roblox	10/03/21	$64.50	$69.50	7.8%
Coinbase Global	14/04/21	$381.00	$328.28	−13.8%
Squarespace	19/05/21	$48.00	$43.65	−9.1%
ZipRecruiter	26/05/21	$20.00	$21.10	5.5%

Source: Ritter (2021, p. 2)

Table 2: Output results

VAO.F			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	−0.00103	0.000757	0.175644
Ω	0.000047	0.000021	0.029228
α	0.131885	0.050994	0.009702
β	0.767027	0.043174	0.000000
ϒ	0.200175	0.059519	0.000770*
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	2.681	0.1015	
Lag[2*(p+q)+(p+q)-1][2]	2.828	0.1562	
Lag[4*(p+q)+(p+q)-1][5]	3.472	0.3275	
d.o.f=0			
Noratis AG			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.000568	0.000433	0.189701
Ω	0.000036	0.000012	0.00297
α	0.170018	0.06877	0.013426
β	0.676851	0.063746	0.000000
ϒ	0.130664	0.094379	0.166218
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	7.33	0.006781	
Lag[2*(p+q)+(p+q)-1][2]	7.333	0.009722	
Lag[4*(p+q)+(p+q)-1][5]	9.802	0.010347	
d.o.f=0			
DHER.F			
Robust Standard Errors:			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.001636	0.000745	0.028084
Ω	0.000178	0.000073	0.014632
α	0.063286	0.052236	0.225693
β	0.676648	0.09175	0.000000
ϒ	0.041474	0.080272	0.605386
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	1.167	0.28	
Lag[2*(p+q)+(p+q)-1][2]	1.517	0.357	
Lag[4*(p+q)+(p+q)-1][5]	2.409	0.5254	
d.o.f=0			
MOY			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.00096	0.000636	0.131122
Ω	0.000011	0.00000	0.000000
α	0.0000000	0.006562	0.999971
β	0.962092	0.002777	0.000000
ϒ	0.033457	0.017125	0.05*
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	6.533	0.01059	
Lag[2*(p+q)+(p+q)-1][2]	6.935	0.0124	
Lag[4*(p+q)+(p+q)-1][5]	8.696	0.01975	
d.o.f=0			
N4G.F			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.001387	0.002354	0.555864
Ω	0.000064	0.000035	0.06759
α	0.032737	0.017476	0.061029
β	0.956451	0.010108	0.000000
ϒ	-0.02272	0.024015	0.344075

(*Contd...*)

Table 2: (*Continued*)

Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	0.294	0.5877	
Lag[2*(p+q)+(p+q)-1][2]	1.104	0.4658	
Lag[4*(p+q)+(p+q)-1][5]	3.974	0.2574	
d.o.f=0			
HFG.F			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.001752	0.000973	0.071834
Ω	0.000024	0.00001	0.014027
α	0.0000000	0.012056	0.999998
β	0.946188	0.01435	0.000000
Υ	0.075979	0.022854	0.000886*
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	0.5605	0.4541	
Lag[2*(p+q)+(p+q)-1][2]	0.5605	0.6659	
Lag[4*(p+q)+(p+q)-1][5]	0.8583	0.8908	
d.o.f=0			
VBX			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	-0.00117	0.001482	0.43001
Ω	0.000139	0.000121	0.2512
α	0.047396	0.029475	0.107840
β	0.834191	0.0812	0.000000
Υ	0.167799	0.114173	0.141650
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	0.706	0.4008	
Lag[2*(p+q)+(p+q)-1][2]	0.7417	0.5902	
Lag[4*(p+q)+(p+q)-1][5]	2.4268	0.5216	
d.o.f=0			
BFSA			
Robust Standard Errors			
	Estimate	**Standard error**	**Pr(>|t|)**
μ	0.00096	0.000636	0.131122
Ω	0.000011	0.00000	0.000000
α	0.0000000	0.006562	0.999971
β	0.962092	0.002777	0.000000
Υ	0.033457	0.017125	0.05*
Weighted Ljung-Box Test on Standardized Residuals			
statistic P value		**P-values**	
Lag[1]	6.533	0.01059	
Lag[2*(p+q)+(p+q)-1][2]	6.935	0.0124	
Lag[4*(p+q)+(p+q)-1][5]	8.696	0.01975	
Pr(>|t|)			

*β= the coefficient of the GARCH term.

α= The coefficient of the ARCH term of RESID.

Y= Leverage coefficient (Indicating the presence of overreaction and underreaction)

firm generates a 10% return, it will be valued at more than 5 times its price excluding other risk factors. Thus, a firm with a turnover of about €1 million with a turnover period of 15 years may be sold for about €7 million. This amount might decrease to €5 million during recession and increase to €10 million during expansion. The valuation models are predominantly based on anticipations where the intrinsic values are negligible. Private firms can also choose to go public without any underwriter, meaning that the firm skips the underwriting process and assumes more risk if the issue underperforms but benefits if the IPO stock performs well. Direct listings are usually feasible for strong and well-known brands with attractive business models. Also, there are negative factors which may negatively impact the return of an issue; therefore, IPOs are publicized excessively by the underwriter in trying to mitigate any losses. The gains in the initial period may be followed by losses due to the expiration of the lockup period. Before a private firm

goes public, private shareholders normally sign a lockup agreement which are binding agreements that forbids the private shareholders from trading firms security which may be up to 600 days in certain countries like the United Kingdom. After the lock up period, these shareholders are permitted to sell their stocks resulting in a massive sale to realise profits. However, there may be excess supply of the stock which may causing a downward trend in the stock price. There are several reasons for going public in which the firm might be unwilling to source additional capital through debt and opt for equity financing. Also, the firm might want to raise capital from the public to finance its capital expenditure or additional working capital needs where issuing stock to finance debt obligations provides another viable option for IPOs.

Overreaction and underreaction may exist when a security's price differs from its fundamental price as define by Efficient Market Hypothesis. This relates to the change in market price that cannot be directly linked to new or relevant information in the market (Woo et al., 2020). Although there is some evidence of market efficiencies (Fama, 1965), prior research has also identified the existence of inefficiencies in markets caused by market anomalies (Nurdina et al., 2021) If persistent, the anomaly renders the concept of efficiency ineffective. According to Enow (2023), the several types of anomalies that have been observed are;

- Calendar effect: January, weekend and holidays
- Overreaction: Prices react to news
- IPOs: Initial overreaction and long-term underperformance
- Earnings surprises: Slow adjustments
- Momentum: Continuous upward trends in stock returns
- Size effect: The ability of small cap stocks to outperform
- Value effect: Low price earnings ratio, low price to book ratio and high dividend yield.
- Close ended funds selling at a discount to net asset value.

Adequately pricing IPOs partly depends on whether investors behave rationally which is consistent with the EMH principle because all the necessary information is available to the public (Enow, 2023). In other words, the long-term stock price of a security should reflect its fundamental values. However, the returns may be driven by market sentiments, which is evident when a firm announces higher than expected earnings or a decrease in earnings. In congruence with the exacerbation hype in IPOs, there is an increasing need to ensure that IPOs are not mispriced partly because of overreaction and underreaction which has led to the researcher's interest in investigating overreaction and underreaction. It is also important to understand whether the prices of IPOs are justifiable or overreact and underreact to new information.

In the context of IPO literature, an empirical analysis will provide valuable insight which may provide guidance on the psychology of investing such as, sell after a bad performance and buy after good performance. It is also worth noting that empirically analysing the overreaction and underreaction in IPOs is not a punitive strategy for private firms willing to go public, but rather an incentive-based approach which focuses on maintaining a sustainable market price. In turn, investigating the overreaction and underreaction in IPOs, seeks to better understand investor's behaviours by identifying and capitalising on emotions and behavioural driven anomalies. Therefore, this study is relevant as it aims to examine and understand overreaction and underreaction in addition to the fact that it is aligned with the renewed interest in behavioural finance. The next section highlights the research method.

3. RESEARCH METHODOLOGY

In exploring overreaction and underreaction, eight IPOs namely Vates Aktien Offensiv (VAO.F), Noratis AG, Delivery Hero SE (DHER.F), The NAGA Group AG (N4G.F), Voltabox AG (VBX.F), CM-AM Obli Moyen Terme RC (MOY), HelloFresh SE (HFG.F) and Befesa S.A. (BFSA.F) listed on the DAX (the Frankfurt index). These IPOs were analysed separately based on the year in which they were listed to have an in-depth understanding of how they react to good and bad news. A TGARCH model was employed to estimate asymmetries relating to the variability in the daily stock prices. A TGARCH model unveils asymmetric responses in stock prices by comparing the volatility of the stock price to lag squared residuals and abnormal returns (Lim and Sek, 2013). If the p-value of the TGARCH is significant, there is persistence of immediate variance based on market shocks signalling overreaction or underreaction (Strydom and Charteris, 2011). This method was also used in the study of Fang (2013) to investigate overreaction and underreaction. A TGARCH model is as follows.

$$h = \mu + \beta_{h^{t-1}} + \alpha \mu_{t-1}^2 + \Upsilon \mu_{t-1}^2 D_{t-1} + \Omega \quad (1)$$

The section below presents the results and analysis.

4. DATA RESULTS

From the table 2 above, it can be observed that the coefficient of the asymmetric term (Y) for the sampled IPOs are statistically significant for VAO.F, MOY, HFG.F and BFSA. Table 2 also confirms the presence of overreaction and underreaction and asymmetry anomalies in some IPOs. The implications of the significant leverage coefficients connote that investors tend to overreact or underreact to information entering the market. The findings of this study suggest that adverse new information to the market may have strong impact on IPO returns. Market participants need to be cognisant of this anomaly in IPOs and factor in some form of risk measure in pricing IPOs. This finding is in tandem with the findings of Fang (2013); Parveen et al. (2020) who also found overreaction and underreaction in some equity securities. However, this study contradicts the study of Ma, Tang and Hasan (2005) who could not detect the presence of overreaction and underreaction in some financial assets.

5. CONCLUSION

From the data analysis and findings, the returns of the IPOs followed an asymmetric pattern where the leverage coefficients were statistically significant in some IPOs and insignificant in others. This result is not surprising considering the proposition

put forth by the prospect theory where investors take decisions about prospects based on uncertainty associated with the different outcomes. Evidence of overreaction and underreaction may create supply and demand imbalances that distorts market efficiencies. Also, there might not be many benefits holding IPOs beyond the lock-up period which is characterise by massive sale. Also, the findings of this study may suggest that risk in IPOs emanates from uncompensated risk from price volatility and skewness of the price distribution (Chang et al., 2013). This positive skewness in the IPO returns may pose significant risk where investors may often suffer from constant small losses and few extreme profits associated with first-day profits (Bhardwaj, 2018). Considering the aforementioned, it will be prudent to assign a risk coefficient when pricing IPOs due the possibility of overreaction and underreaction as seen in some of the IPOs that were listed in 2017. Regulatory authorities should constantly censor IPO adverts to reduce the hype created by investment bankers.

REFERENCES

Agostinetto, L. (2018), Long Run Performance of IPOs on the JSE: Taking it to 10 Years. Published Master Dissertation. Johannesburg: University of the Witwatersrand.

Benner, K. (2008), Visa's Record IPO Rings up 28% Gain. Available from: https://money.cnn.com/2008/03/19/news/companies/visa_ipo_opens.fortune/index.htm

Chandra, P. (2016), Behavioural Finance. 2nd ed. New Delhi: McGraw Hill.

Chang, B.Y., Christoffersen, P., Jacobs, K. (2013), Market skewness risk and the cross section of stock returns. Journal of Financial Economics, 107, 46-68.

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

Enow, S.T. (2023), A non-linear dependency test for market efficiency: Evidence from international stock markets. Journal of Economics and Financial Analysis, 7(1), 1-12.

Enow, S.T. (2023), Modelling and forecasting volatility in international financial markets. International Journal of Research in Business and Social Science, 12(29), 197-203.

Fang, Y. (2013), Empirical Study on overreaction and underreaction in Chinese stock market based on ANAR-TGARCH model. Journal of Financial Risk Management, 2(4), 71-76.

Fernando, J. (2021), Initial Public Offering (IPO). Available from: https://www.investopedia.com/terms/i/ipo.asp

Fromlet, H. (2001), Behavioral finance-theory and practical application: Systematic analysis of departures from the homo-economicus paradigm are essential for realistic financial research and analysis. Business Economics, 36(3), 63-69.

Gitman, L.J., Zutter, C.J. (2012), Principles of Managerial Finance. 13th ed. Boston: Pearson Education Limited.

Gunnelin, R.H. (2019), Empirical Studies of Auctions of Non-distressed Residential Real Estate. Published Dissertation. Stockholm: KTH Royal Institute of Technology.

Hirshleifer, D. (2003), Investor psychology and asset pricing. The Journal of Finance, 56(4), 1533-1597.

Hong, H., Stein, J. (1999), A unified theory of underreaction, momentum trading and overreaction in asset markets. Journal of Finance, 54(6), 2143-2184.

Keith, C., Brown, W., Kenneth, W. (2015), In search of unicorns: Private IPOs and the changing markets for private equity investments and corporate control. Journal of Applied Corporate Finance, 27(3), 34-48.

Lim, C.M., Sek, S.K. (2013), Comparing the performances of GARCH-type models in capturing the stock market volatility in Malaysia. Procedia Economics and Finance, 5, 478-487.

Ma, Y., Tang, A.P., Hasan, T. (2005), The stock price overreaction effect: Evidence on Nasdaq stocks. Quarterly Journal of Business and Economics, 44(4),113-127.

Maggio, M.D., Pagano, M. (2014), Financial Disclosure and Market Transparency with Costly Information Processing. Working Paper No. 485.

Mahesh, K.M. (2016), Behavioural finance: A challenge to market efficiency. International Journal of Engineering Science and Computing, 6(10), 2977-2980.

Merli, M., Roger, T. (2013), What drives the herding behavior of individual investors? Finance, 34, 67-104.

Naveed, F., Taib, H.M. (2021), overconfidence bias, self-attribution bias and investor decisions: Moderating role of information acquisition. Pakistan Journal of Commerce and Social Sciences, 15 (2), 354-377.

Nurdina, N., Sidharta, R.Y., Mochklas, M. (2021), Inefficient markets, anomalies, and investor behavior: A literature review. International Journal of Economics, Business and Accounting Research, 5(2),354-374.

Parveen, S., Satti, Z.W., Subhan, Q.A., Jamil, S. (2020), Exploring market overreaction, investors' sentiments and investment decisions in an emerging stock market. Borsa Istanbul Review, 20(3), 224-235.

Potter, M. (2010), Ocado Shares Trade Below IPO Price. Available from https://www.reuters.com/article/uk-ocado-idUKLNE66K00320100721

Reilly, F.K., Brown, K.C. (2003), Investment Analysis and Portfolio Management. 7th ed. Australia: Thomson South-Western.

Strydom, B., Charteris, A. (2011), An Analysis of the Volatility of African Short-term Interest Rates Using a Component GARCH Model. (Working Paper No.1). South Africa: University of Kwazulu-Natal.

Van Heerden, G., Alagidede, P. (2013), Short run underpricing of initial public offerings (IPOs) in the Johannesburg Stock Exchange (JSE). Review of Development Finance, 2, 130-138.

Woo, K.Y., Mai, C., McAleer, M., Wong, W.K. (2020), Review on efficiency and anomalies in stock markets. Economies, 8(1), 1-51.