

Initial Public Offerings (IPOs) in Pakistan Stock Exchange: The Underpricing and the Long-Term Underperformance Anomalies

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ABSTRACT

This study uses the event study approach to analyze the short- and long-term performance of the IPOs of Octopus Digital and Airlink Communication on the Pakistan Stock Exchange from 2021 to 2024. The study examines the impact of the initial public offering announcement on the stock prices of these two companies over a short-term event window of 20 days as well as a long-term event window of 2.5 years. The empirical results show underpricing in the short-term and underperformance in the long term, which is consistent with previously found empirical results in both developing and developed countries

Keywords: initial public offering, short run, long run, event study, underpricing, abnormal returns, Pakistan stock exchange

ÖZ

Bu çalışma, Octopus Digital ve Airlink Communication'un Pakistan Borsa'sındaki halka arzlarının kısa ve uzun dönem performansını analiz etmek için olay çalışması yaklaşımını kullanmaktadır. Çalışma, bu iki şirketin hisse senedi fiyatları üzerindeki halka arz duyurusunun etkisini 20 günlük kısa dönem olay penceresi ile 2,5 yıllık uzun dönem olay penceresi boyunca incelemektedir. Ampirik sonuçlar 2021-2024 yıllarını kapsamakta olup, kısa dönemde düşük fiyatlandırma ve uzun dönemde düşük performans göstermektedir; bu durum, hem gelişmekte olan hem de gelişmiş ülkelerde daha önce bulunan ampirik sonuçlarla uyumludur.

Anahtar Kelimeler: halka arz, kısa dönem, uzun dönem, olay çalışması, düşük fiyatlandırma, olağanüstü getiriler, Pakistan Borsası.

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Chapter 1

INTRODUCTION

1.1 Study Background

An initial public offering (IPO) refers to the issue of securities to the public (i.e., investors) for the first time (Ali et al., 2020). In recent decades, numerous organizations globally have opted to go public. A company undergoes an initial public offering (IPO) when its equity shares become available to the public for the first time (Sohail & Nasr, 2007).

Most companies initially raise equity money from a limited number of investors, but there is no liquid market available for these investors to sell their shares. When a company thrives and requires supplementary equity capital, it often seeks to 'go public' by offering shares to a broad array of diversified investors (Ibbotson & Ritter, 1995). When the stock goes public, this higher liquidity makes it easier for the company to get financing at better terms than if it had to pay investors for the limited liquidity that comes with a privately held business (Ibbotson & Ritter, 1995).

The aim of any initial public offering is to maximize the issuer's value while facilitating a favorable commencement of secondary trading and robust long-term aftermarket performance (Sohail & Nasr, 2007). Primarily, newly founded companies or those industries experiencing a deficiency of money, or seeking to expand their operations, provide Initial Public Offerings (IPOs) to investors (Ali et al., 2020). The

IPO facilitates companies to allocate their resources, invest, upgrade traditional technology to contemporary technology, and enhance capital and labor efficiency through the use of skilled workers (Ali et al., 2020). The initial public offering available to the general public is the predominant method of funding, particularly for private companies, since investors allocate capital to maximize their financial returns (Ali et al., 2020).

Brau and Fawcett (2004) argue that the primary objective for going public is to generate publicly traded shares for potential future acquisitions. Reducing the cost of capital is not one of the three primary incentives for pursuing an initial public offering (Brau & Fawcett, 2004). Upon the stock becoming publicly listed, the increased liquidity enables the company to secure financing under more advantageous conditions than if it were required to compensate investors for the illiquidity inherent in a privately held entity.

Nonetheless, becoming a publicly traded company includes additional expenses. Specifically, there are recurring expenses related to the obligation to provide information regularly to investors and regulators for publicly traded companies (Ibbotson & Ritter, 1995). Additionally, significant one-time expenses related to initial public offerings might be classified as direct and indirect costs. The direct expenses encompass legal, auditing, consulting, registration, administrative and underwriting fees. The indirect costs include the management's time and effort spent on the offering and the underpricing. The underpricing cost is incurred when the public offer price is lower than the intrinsic price of the company. In other words, on the first day of trading, a significant increase is observed in the price of the company. The underpricing phenomenon is well established in the literature and on average, the stock prices of

IPO companies have significant positive abnormal returns (Ibbotson & Ritter, 1995). Both direct and indirect costs influence the capital expenditure for companies pursuing public offerings (Ibbotson & Ritter, 1995).

For the specific case of Pakistan, the results of the probit analysis by Rasheed and Sohail (2019) show that the features of earlier IPOs suggest that Pakistani companies who go public are generally younger, riskier, more profitable, and larger than those that remain private. Companies within the general trade category are more inclined to become publicly traded. Their findings of the ex-post consequences analysis indicate that firms opt for public offerings; (a) to augment capital expenditures post-listing to support future growth and expansion; (b) to enhance investments aimed at diversifying business operations, including investments in holding companies, affiliated entities, and financial assets; (c) the decision to go public serves to dilute ownership and mitigate risk; and (d) this decision also facilitates the rebalancing of financial leverage and alleviates the burden of financial distress (Rasheed & Sohail, 2019).

Literature on the growth stages of companies emphasizes the significance of capital accumulation and the function of financial institutions in that regard (Stiglitz, 1989). Capital markets fulfill essential functions by consolidating savings and distributing funds. In executing these responsibilities, they select not just from rival sectors but also from competing management teams (firms) (Stiglitz, 1989).

The stock market is regarded as a significant exchange market. The stability of the stock exchange rate influences trade, resulting in a consistent impact on investors, companies, and traders. In developed and developing countries around the world, researchers have extensively studied and reported empirical evidence on IPO

underpricing. The IPO underpricing has attracted much scrutiny in finance because of its enduring characteristics and its consequences for both investors and issuers (Ullah & Sohail, 2020). The pricing and performance of IPOs remain a contentious topic in financial literature. Many hypotheses have been made by finance scholars who have spent a lot of time thinking about why average initial returns from IPOs on the first day of trading are abnormally high and why IPO companies underperform in the long run relative to the companies which have had their IPOs previously and have been trading in the market for a while. However, some studies show that IPOs have long-term outperformance, yielding positive anomalous returns for investors beyond the initial underpricing phase (Ullah & Sohail, 2020).

1.2 Objectives of the Study

This research examines the effects of the initial public offering phase in a company's lifecycle on its long-term and short-term success and performance, as indicated by daily abnormal returns data of the stock listed by the company. In this study, two Pakistan companies, namely Airlink Communication and Octopus Digital, are consciously selected as case studies for IPOs in Pakistan. The rationale for selecting Airlink Communication is its status as the largest private-sector IPO in Pakistan. The reason for selecting Octopus Digital is its distinction as the most oversubscribed IPO in recent history, marking a historic case in Pakistan's IPO landscape. Both companies are in the technology sector. Specifically, Airlink Communication is in the distribution of electronics and computers, and Octopus Digital is in the software and software-infrastructure business.

This study aims to examine the short- and long-term performance of IPOs of Octopus Digital and Airlink Communication on the Pakistan Stock Exchange. The traditional event study methodology is used to measure both short- and long-term performance and additionally, the wealth ratio is used for the long-term performance. The market model is used to calculate the abnormal returns in the event study. The empirical analysis for Octopus Digital company investigates a short-term period from October 5, 2021 (first day of trading) to November 11, 2021 (i.e., 20 days event window), and a long-term period from October 5, 2021 (first day of trading) to February 20, 2024 (i.e., around two and half years). The short-run sample period for Airlink Communication ranges from September 22, 2021 (first day of trading) to May 12, 2022 (i.e., 20 days event window), and the long-run period goes from September 22, 2021, to February 20, 2024 (i.e., around two and half years).

For both companies, this study aims; (1) to examine the IPO underpricing phenomenon for both firms; (2) to examine the first-day and the 20-days event window abnormal returns; (3) to examine the existence of overreaction/underreaction over the event window; and finally, (4) to assess the long-term performance of both companies during the post-listing period.

1.3 Thesis Structure

The second chapter comprises a literature review concentrating on the early motivations for IPOs, along with their advantages and disadvantages. This chapter elucidates performance patterns and theories that illuminate the phenomena of an IPO underpricing and underperformance for short and long run period. This chapter also provides with the insights of how initial public offering procedure takes place on the Pakistan stock exchange. The next section provides the information relating the

Octopus Digital and Airlink Communication, including the data, empirical methodology, results, and a discussion of the findings. the last chapter summarizes the analysis and defines the conclusion.

Chapter 2

LITERATURE REVIEW

2.1 Going Public

One of the most significant decisions in corporate finance is whether to go public. The majority of textbooks on corporate finance only discuss the institutional implications of this choice, and make brief mentions of its rationale. According to popular belief, going public is just a phase in a company's development. However, some big businesses, like Bechtel and United Parcel Service, are not publicly traded even in sophisticated capital markets like the US (Pagano et al., 1998). Pagano et al. also find that going public is a decision rather than a stage that all businesses eventually reach.

It is crucial to have a comprehensive understanding of the economic factors that influence going public decisions, both from the perspective of the firm and that of exchanges, which have the power to influence these decisions through their listing requirements. For example, what types of firms should be permitted to go public at this exchange? (Chemmanur & Fulghieri, 1999). According to Pagano et al. (1998), the most important question is the following before initiating the process of going public: At what stage in its life should a firm go public rather than financing its projects through a private placement of equity (e.g., with a venture capitalist)?

A company's formal and public standing is improved by listing on the exchange, which is a graduating step. Listed businesses are the epitome of efficiency and profitability,

giving investors a way to profit from and partake in the company's expansion (Pakistan Stock Exchange, n.d.). According to Pagano et al. (1998), the primary factor influencing the likelihood of an IPO is the market-to-book ratio. An increase of one standard deviation in this ratio could indicate that businesses are attempting to time the market or that there is a greater demand for investment in industries with significant development potential. After significant investments and unusual growth, larger organizations are more likely to go public.

Initial public offerings (IPOs) are one of the most significant events in corporate finance. Per Fischer's (2000) study, at a certain stage of a company's existence, going public seems to be a significant way to change the corporate financial and ownership structure. Bancel and Mittoo (2007) highlight the major motivations for going public, including raising growth financing and facilitating exit strategies, but differ in assumptions and trade-offs. They also note that motivations may differ across countries due to legal and institutional differences.

According to Chemmanur and Fulghieri (1999), the driving forces for going public include a publicly observable share price, the need to convince a wider range of investors about the quality of the company's projects, and more distributed share ownership. They also state that private companies depend on a smaller number of investors whereas public companies raise money by selling shares to a wide range of investors. Going public also lowers the overall costs associated with external review (monitoring) by enabling inexperienced investors to deduce details about the company's projects. Such factors motivate a private company to go public in its lifetime.

According to Kadi (2016), every action associated with trading on the stock exchange is a step in the investing process; thus, it can be asserted that such financial transactions extend beyond mere purchasing or selling of specific securities. Kadi (2016) believes that the motivations for listing on the stock exchange might be diverse and are associated with the advantages that may accrue to the company from such a listing. In circumstances where a firm needs finance to pursue more investments, it may opt to seek public funding via a stock exchange listing. Furthermore, once a company is listed on a stock exchange, its shareholders will gain control over its capital, which extends beyond their initial investment. Kadi (2016) suggests that stock market listing positively influences the performance and transparency of many companies.

Going public signifies a crucial turning point in the trajectory of a nascent company. It grants access to public equity money, thereby reducing the cost of financing the company's operations and investments. The process of going public highlights the company, and the resulting publicity may yield indirect advantages, such as attracting higher-quality management (Ljungqvist, 2007). Private companies frequently pursue public offerings to acquire cash, enhance shareholder liquidity, bolster reputation, and generate a valued currency, namely shares.

Nonetheless, assessing the advantages of an IPO necessitates consideration beyond merely enumerating costs and gains (Draho, 2004). Public equity incurs greater fixed direct costs than private equity, with the anticipated return contingent upon the risk, liquidity, and marketability of the shares. Smaller enterprises may perceive public equity as more costly, challenging the notion that an IPO offers inexpensive funding. A comprehensive examination is essential for all elements pertinent to the IPO choice (Draho, 2004). Fischer (2000) suggests that enterprises with substantial debt and

significant investment, companies in emerging industries, high-tech corporations, and those with controlling founders are more likely to pursue public offerings. The likelihood of an IPO increases with the number of publicly traded firms in the same industry, and sectors with significant anticipated market growth, network externalities, or minimal production cost variations are more likely to pursue public offerings (Fischer, 2000).

2.2 Advantages of IPOs

Acquiring access to a financing source alternative to bank or bond financing is arguably the most frequently mentioned advantage of going public, which is explicitly or implicitly reflected in most models. The prospect of accessing public markets for capital is especially attractive for firms with substantial present and anticipated investments, significant leverage, and robust growth potential. All these elements should be positively correlated with the probability of an IPO (Pagano et al., 1998).

The primary objective of an IPO is to generate capital, whether for financing new initiatives or enhancing liquidity for operational requirements. Listing on the Exchange will facilitate access to extensive liquid capital from both national and foreign investors, ensuring a varied investor base (Pakistan Stock Exchange, n.d.-a). Funds acquired via the Exchanges are comparatively less expensive, particularly in a climate of increasing interest rates, assisting organizations in diminishing their reliance on expensive long-term and short-term debt (Pakistan Stock Exchange, n.d.-a).

Bank loans can be problematic as they extract rents from customer credit worthiness. Companies can access the stock market, attract competition, and lower credit costs.

Going public offers diversification opportunities, diversification through divesting, reinvesting, or raising equity capital (Pagano et al., 1998).

Most investors maintain portfolios that include only a minor percentage of available securities, often due to a lack of awareness about specific companies. Listing on a prominent exchange can mitigate this issue by serving as a promotional tool for the company (Bancel & Mittoo, 2007). A publicly traded corporation possesses a more credible and transparent public image. The listing provides complimentary publicity and awareness, thereby indirectly enhancing the organization's fundamental activities (Chemmanur & Fulghieri, 1999).

The stock market serves as a managerial discipline mechanism by introducing the threat of hostile takeovers and revealing the market's evaluation of managerial decisions. Shareholders may utilize stock prices to construct enhanced client compensation structures for their managers, including linking wages to stock prices or providing stock options. When a substantial planned expansion necessitates numerous investors, the expense of excessive oversight becomes prohibitive rendering a public offering more advantageous (Bancel & Mittoo, 2007).

IPOs create possibilities for companies to capitalize on investor overvaluation and secure essential finance for expansion initiatives. The stock market significantly influences corporate decision-making (Bancel & Mittoo, 2007). Listing can recruit top personnel, improve relationships with current and prospective customers and suppliers, expand chances for partnerships with local and international firms, and bolster employee dedication through share ownership programs. Listing on the exchange offers equity funding alternatives for businesses to enhance their operations

and grow their activities (Pakistan Stock Exchange, n.d.-a). The stock exchanges comprise multiple indices for monitoring the performance of the country's foremost enterprises. Listing will provide the chance to become part of these indexes, thereby enhancing your international recognition (Pakistan Stock Exchange, n.d.-a).

According to Fischer (2000), financial limitations can be surmounted by cost-effective direct financing, diversification, enhanced liquidity, and improved negotiating power with financiers. Ueda and Sharma (2020) suggest fewer financial limitations for the listed companies. They hypothesize that private company owners who strongly oppose listing in most nations may have personal advantages, but also confirm that they are subject to more stringent financial restraints.

The Pakistan Stock Exchange (PSX) is a trading market where investors trade shares to earn a profit. The market offers several benefits, including long-term investment, safe investment, annual dividends, time-free investment, short-term business, investment diversification, market movement advantage, and the facilitation of brokerage firms (Benefits of Investment in Pakistan Stock Exchange, n.d.). The stock market offers advantages, such as market movement, allowing investors to sell their stock at the time of maximum profit. Brokerage firms offer facilities to investors, instilling patience in the market. Tax benefits are also available, with the market providing tax benefits for businesses. Shareholders can distribute dividends, which lessens the impact of losses. High returns, such as 10% of the investment annually, attract investors. Online business is another advantage of the stock exchange, as it allows for simple stock buying without the need for physical visits. Ownership of companies is not complete, but it provides an opportunity for investors to vote in their decisions (Benefits of Investment in Pakistan Stock Exchange, n.d.). The platform

facilitates the trading of a company's shares, allowing shareholders to diversify their investments and capitalize on their backing, a crucial factor for venture capitalists (Benefits of Investment in Pakistan Stock Exchange, n.d.).

2.3 Disadvantages of IPOs

Going public can be costly due to adverse selection, administrative fees, and stock exchange disclosure regulations. These costs are more significant for small companies and do not increase proportionately with the IPO size. Additionally, companies must disclose proprietary information to reduce tax avoidance. Research shows an inverse relationship between industry R&D intensity and IPO likelihood (Pagano et al., 1998). According to Fischer (2000), as fixed explicit costs of an IPO, uninformed retail investors receive compensation for the risks of poor selection, redundant information costs, public's loss of control advantages, and loss of confidentiality. The IPO literature identifies direct costs such as underwriting expenses, and indirect costs such as increased transparency and listing obligations, as well as diminished secrecy (Bancel & Mittoo, 2007). CFOs identify professional expenses, including those for banking, legal, and accounting services, as the primary direct costs associated with an IPO.

Additional expenses encompass public relations expenditures, management time, reporting frequency, and the necessity to modify accounting processes (Bancel & Mittoo, 2007). Besides the initial underpricing, going public implies considerable direct costs, underwriting fees, and registration fees. In addition to the initial costs, there are annual expenses for the auditing certification and the dissemination of accounting information to the stock exchange. Since many of these expenses do not increase proportionally with the size of the IPO, they weigh relatively more on small companies (Pagano et al., 1998). Concurrently, the company incurs new obligations

regarding transparency and disclosure requirements, becoming accountable to a broader cohort of relatively anonymous shareholders who are likely to express their dissent by divesting rather than supporting the company's decision-makers as a venture capitalist would (Ljungqvist, 2007). The trade-off between costs and benefits of an IPO demonstrates that the advantages substantially exceed the expenses, indicating that costs are not a big concern for most organizations.

2.4 IPO Underpricing

In accordance with Aslam & Ullah (2017), the key factors contributing to IPO underpricing include the firm's size, age, timing of the IPO, and the underwriter's reputation. Several theories try to explain the underpricing phenomenon such as the asymmetric information signaling hypothesis (Leland & Pyle, 1977), the prestigious underwriter hypothesis and the window of opportunity hypothesis (McDonald & Fisher, 1972), and the prospect hypothesis (Loughran & Ritter, 2002).

Both developed and emerging markets have short-term underpricing and long-term underperformance of IPOs (Aslam & Ullah, 2017). Aslam and Ullah examine the initial public offering underpricing and identify the causes of IPOs listed on the Pakistan Stock Exchange from January 2000 to December 2010. They show the existence of the underpricing phenomenon in the Pakistan Stock Exchange and the underpricing is aimed to diminish the ambiguity between informed and uninformed investors throughout the IPO process (i.e., also known as the winner's curse). Aslam and Ullah conclude that some players (informed investors) in IPO transactions has superior information compared to others (uninformed investors) leading to informational asymmetry that causes the IPO underpricing. According to Mehmood et al. (2021) Research on Chinese listed IPOs reveals high levels of underpricing, with

factors such as educational background, age, tenure, and functional background affecting the underpricing. In Bangladesh, company size and firm age are strongly correlated with underpricing. However, industry size and timing do not correlate with substantial initial returns. In the Chittagong Stock Exchange, significant ownership interest and active foreign ownership reduced underpricing (Mehmood et al., 2021). Reserve price and oversubscription are the primary reasons for underpricing in Vietnam (Mehmood et al., 2021).

Aslam and Ullah (2017) state that the underpricing is mostly attributable to the information asymmetry among the three parties participating in the IPO process, namely the initial public offering firm, the underwriter, and the investor. One side possesses superior information compared to the other, generating doubt and apprehension. The Asymmetric information models suggest that one party has more knowledge than others, leading to a principal-agent dilemma and underpricing. The issuer's superior knowledge of its actual value enables certain investors to avoid involvement in inflated IPOs. This creates a “winner's curse” for uninformed investors (Ljungqvist, 2007).

Chhabra et al. (2017) find that the sale of promoters' stock and the reputation of underwriters are the primary factors affecting information. The model shows that the availability of information has a negative impact on the first-day returns. It suggests that issuers who provide substantial public information face lower returns on the listing day, which results in their issues being less underpriced. The increase in underpricing is not explained by the composition of firms that undertake an IPO. Chambers and Dimson (2009) propose multiple interconnected explanations for this conundrum, mostly driven by the diminished trust among investors, issuers, and sponsors. In

accordance with this interpretation, they stress the investment banks' hesitance to maintain issuance procedures that alleviate underpricing, the influence of equity market institutionalization, and the issue of a winner's curse.

2.5 An Overview of Pakistan Stock Exchange Market

Stock market is an essential part of the free-market system since it offers the opportunity for buyers and sellers to exchange the shares of publicly traded companies registered in the country's stock exchange. Pakistan's stock exchange is just like every other stock exchange worldwide. The Karachi Stock Exchange was the original name of the Pakistan Stock Exchange (PSX), which was established on September 18, 1947 just 2 months after the independence of Pakistan. On January 11, 2016, the three trading floors of the Karachi Stock Exchange, Lahore Stock Exchange, and Islamabad Stock Exchange merged to form the Pakistan Stock Exchange, a single exchange platform. Karachi, a very populous metropolis in Pakistan, was the location of the integrated platform (Pakistan Stock Exchange, 2024).

All exchange platforms globally share the universal objective of ensuring the security of dealers' transactions. As the objectives of the exchange platforms became evident, it became apparent that the securities and exchange commission was necessary. Uppal (2009) demonstrates the significance of the Securities and Exchange Commission of Pakistan (SECP), which has been responsible for overseeing, supervising, and managing the Pakistan stock market since its establishment in 1947. However, according to Uppal (2009), three exchanges function as self-regulatory organizations (SROs) that handle matters related to broker behavior, market monitoring, admission of trading members, and listing of securities. The SECP must register and grant a permit to every business involved in the exchange activities. This permit allows them

to conduct financial transactions within the boundaries of the stock exchange's laws and regulations (Uppal, 2009). In addition to the importance of security and regulation, Pakistan Stock Exchange (n.d.-b) brings light to the importance of trading system and IT security. The Pakistan stock exchange boasts trading systems such as KATS (Karachi Automated Trading System), KITS (Internet-based order routing system), and BATS (Bonds Automated Trading System), in addition to IT security systems and a sophisticated regulatory framework that rivals that of leading global exchanges. Furthermore, Iqbal (2012) highlights that SPEC, in addition to supervising the PSX stocks, also has regulatory jurisdiction over the Central Depository Company (CDC), the sole entity responsible for administering electronic transactions on the Pakistan Stock Exchange, which serves as the foundation for Pakistan's capital markets. Established in September 1997, the CDC oversees and controls the high levels of trading activity on Pakistan's stock market, managing all share transactions (Iqbal, 2012).

Since the inception of the PSX, which is not long enough it has come up a long way and is intending to do much better in the future. When it started out it had only 5 listed firms and then 1960 it had about 81 companies and market capitalization of 1.8 billion PKR but if we take a look at PSX today it has about 500 (+ 2 GEM board) corporations and market value of 7.2 trillion PKR (Pakistan Stock Exchange, n.d.-b).

The evolution of the Pakistan stock exchange has significantly influenced its current standing. The market's liberalization is a significant event in the history of the Pakistan stock exchange. The Pakistan stock market underwent official liberalization in 1991, following the trend of market liberalization in many other nations. The liberalization phase refers to the period when foreign investors gained access to the Pakistan stock

market. Iqbal (2012) identified a number of factors that contributed to the decision. Because equity capital is more affordable, market liberalization will result in increased physical investment and economic growth due to the increased affordability of equity capital. This will facilitate the implementation of projects that can stimulate quicker economic growth and enhance risk sharing between local and global investors (Iqbal, 2012).

In its overall journey of more than 75 years, the Pakistan stock market has a lot of moments where it proved its potential and had some moments of limelight as well if we take a look back at the history and beginning of the journey of the market. As Iqbal (2012) mentions in one of these moments, in 2002, the Pakistan stock market was announced as the best performing market in the world via the US news magazine Business Week. Looking at the market in the recent years, we can observe that Pakistan's stock market took home the 2022 and 2023 Best Islamic Stock Exchange Award for three consecutive years (Business Recorder, 2023). The development of additional Islamic financial instruments, including Sukuks, Shariah-compliant mutual funds, modarabas, ETFs, etc., may have been the cause of the award's two consecutive wins (Times of Islamabad, 2023).

The Pakistan Stock Exchange has an impressive history of being among the top exchanges in Asia, and it has even higher aspirations to become one of the world's best stock exchanges. In 2023, the Pakistan Stock Exchange experienced an index increase of approximately 11%, positioning it as the world's best-performing stock market, and further Bloomberg data suggests that agreements with the IMF, made just prior to these performance results, may have contributed to this data boost. (Times of Islamabad, 2023).

The organizational structure of any exchange immense importance the structure of its teams and board of directors the structure of the Pakistan stock exchange consists of its management team, board of directors. The management team consist of 12 members in total at PSX. The PSX management team structure is as follows: Managing Director, Chief Legal & Corporate Affairs Officer, Chief Financial Officer, Chief Regulatory Officer, Chief Information Officer, Chief Internal Audit Officer, Chief Market Operations Officer, Chief Listing Officer, Chief Marketing & Business Development Officer, Chief Product Officer, Chief Risk Management Officer (Pakistan Stock Exchange, n.d.-c).

There are currently 11 members of the board of directors at PSX and the management structure is as follows: Chairperson & Independent Director, Chief Executive Officer/Managing Director and nine shareholder directors (Pakistan Stock Exchange, n.d.-d). Each of these board members is responsible for overseeing the day-to-day operations of the exchange, putting new business plans into action, preserving market integrity, and making sure that all PSX operations are transparent. In addition to the structure, ownership of the stock market is also significant. The ownership control of the Pakistan Stock Exchange (PSX) is split into two categories: Chinese investors own 40% of the exchange, while the general public, which includes both domestic and foreign investors, owns the remaining 60%. A better explanation of this can be found in the figure below (Pakistan Stock Exchange, n.d.-d).



Figure 1:Ownership Structure %
Source: Pakistan Stock Exchange

The market players of the stock market are also really important as they give life to the market by interacting with each other. In Pakistan stock exchange, brokers play an important role in the trading procedure. The top 10 brokers are as follows: AKD Securities Ltd, BMA Capital Management Ltd, JS Global Capital Ltd, Foundation Securities (Pvt.) Ltd, KTrade Securities Ltd, MRA Securities Ltd, Arif Habib Limited, GI Finex Securities Ltd, Mohammad Munir Mohammad Ahmed Khanani Securities Ltd, 10 - Darson Securities (Pvt.) Limited (Pakistan Stock Exchange, n.d.-e).

Pakistan stock market is still developing and can help Pakistan economy boost a lot in the future and is still helping the Pakistan economy to recover due to the development of the stock market of Pakistan it can be a source of a lot of opportunities for the public investors and newly growing business in the country. Pakistan stock exchange functions to help raise capital for business via the IPO process furthermore it also helps the formerly owned business that list themselves on the exchange to save more money for future investments, the Pakistan stock market is not only for big and formerly formed companies but it is a very good platform for the new investors who seek investment opportunities and even government can raise capital for developing projects via the stock market.

2.6 Organization of Pakistan Stock Exchange

In order to comprehend the structure of the Pakistan stock exchange, it is essential to grasp the historical background and consolidation of its three trading floors. This understanding will shed light on the process that led to the establishment of the capital market organization, which currently plays a crucial role in Pakistan's economic development.

The Karachi stock exchange has been the largest in Pakistan since its establishment on September 18, 1947, and subsequent incorporation on March 10, 1949. They named the establishment and located it in the central area of Karachi, Pakistan's largest metropolis. The Securities and Exchange Commission of Pakistan, like all other securities markets and corporate sectors in Pakistan, oversees the Karachi Stock Exchange.

The Karachi Stock Exchange initially comprised five businesses with a paid-up capital of 37 million (Karachi Stock Exchange, 2024). Before the three exchanges merged, people viewed the Karachi Stock Exchange (KSE) as the main national financial market, and the Lahore (LSE) and Islamabad (ISE) markets as regional or subsidiary exchanges (Ali & Sharif, 2022). Approximately 85% of the revenue and the majority of the trading activity, accounting for 85%, took place at KSE. The remaining 14% and 1% of turnover happened in LSE and ISE, respectively as reported by Ali and Sharif (2022). In 2015, the KSE was the most successful stock exchange. According to the Khaleej Times, investors who have utilized US funds to invest in Pakistani equities since 2009 have consistently achieved annual returns of 26%, positioning Karachi as the highest-performing frontier stock exchange worldwide (App, 2015).

The Karachi Stock Exchange Index, also known as KSE-100, later replaced the initial KSE-50 index. One of the most prominent indices on the Pakistan Stock Exchange, the KSE-100 index currently consists of 100 listed businesses. It was introduced in 1991 and serves as a reference point for comparing stock prices after a specific duration has elapsed. The KSE 100 Index selects 34 firms from 35 sectors. KSE-100 select one company from each sector, with the exception of open-ended mutual funds. KSE-100 choose these companies due to their substantial market capitalization. The remaining 66 companies are based on their highest market capitalization (Mansoor, 2008).

In addition to the KSE-100 index, the Karachi Stock Exchange introduced the KSE-30 index in 2006, followed by the KSE All Share index in 1995 and the KMI-30 index in 2008 (Karachi Stock Exchange, 2024). The free float of shares technique, which focuses on the proportion of shares available for trading rather than the total paid-up capital, is used in calculating the KSE-30 index, which specifically includes the 30 most liquid businesses listed on the Pakistan stock market, while the KSE all-share index covers all companies (Karachi Stock Exchange, 2024).

On October 5, 1970, the Lahore stock exchange came into existence. The establishment of the headquarters in the capital city of Punjab province was a response to the growing trading demand in the region, driven by a significant number of investors and businesses. The Lahore stock exchange comprised the LSE-25 and LSETRI indices, which are currently absent from the list of 14 indices on the Pakistan stock exchange (Lahore Stock Exchange, 2024). In his study, Uppal (2009) analyzes the function of the Lahore Stock Exchange (LSE) in relation to the Karachi Stock Exchange across four domains: 1) The process of determining prices; 2) the expenses

associated with transactions; 3) the effectiveness of information dissemination; and 4) the level of market integration. He observes that the transmission of information mostly occurred from the Karachi Stock Exchange KSE to the LSE. Uppal's (2009) research indicates that LSE did play a significant role in price discovery and competed to a considerable degree.

Ali and Sharif (2022) argue that the consolidation of stock exchanges may lead to higher transaction costs, decreased incentives for regulatory compliance due to the dominance of a single profit-oriented exchange, and a slowdown in the capital market's growth. The objective of the Ali and Sharif (2022) study is to assess the efficacy of the regulatory decision to combine two regional exchanges with a dominant stock exchange in terms of informational efficiency. According to Ali and Sharif (2022), having multiple exchanges can foster a feasible environment, but it can also result in fragmented liquidity and operational inefficiencies. Before the merger, the same was applicable to the stock markets in Pakistan (Ali & Sharif, 2022).

On October 25, 1989, the Islamabad stock exchange (ISE) established itself as a legally authorized corporate entity. This exchange platform was designed to cater to the requirements of the underdeveloped northern regions of Pakistan. By establishing an exchange platform in Islamabad, it would benefit the residents of these areas. ISE was the pioneer in Pakistan to establish a consolidated trading platform in 2007 (Islamabad Stock Exchange, 2024). The Islamabad Stock Exchange (ISE) previously utilized the KSE-100 index. However, on January 1, 2004, the ISE introduced its own index, called the ISE-10 index. Currently, the Pakistan Stock Exchange does not include the ISE-10 index in its list of 14 indices, unlike the KSE-100 or KSE-30 indices (Islamabad Stock Exchange, 2024).

The three aforementioned stock exchange platforms underwent an integration process following the enactment of the Stock Exchange (Corporatization, Demutualization, and Integration) Act, 2012. This action altered the fundamental framework of the three exchanges, resulting in their merger into a unified national platform known as the Pakistan Stock Exchange (PSX) (Ali & Sharif, 2022). The “Corporatization” part of the act plays a role here of converting the exchange into public company limited by shares. The “Demutualization” here means separating the mutual owners of the stock exchange from the right of trading. In her research, Masood (2017) states that market data indicates that each exchange has the temporary and legal power to sell 40% of its shares to a private investor who meets specific criteria, referred to as a strategic investor. Her study also shows that the initial integrated member of PSX holds a 40% stake in the combined company's shares, with the general public exchanging the remaining 20% through the demutualization process. Additionally, Masood (2017) concludes that a key objective of this approved demutualization is to guarantee the active involvement of strategic investors in the stock markets through the introduction of innovative products, new investments, and advancing technologies (Masood, 2017).

The primary objectives of the PSX merger are to attract more sophisticated investors and enhance market regulation by implementing new rules and reforms. It is expected that the integration will reduce market fragmentation and provide a strong case for attracting the necessary strategic alliances to provide technical expertise and support (Dawn, 2016). PSX merger has resulted in a common platform where domestic and foreign investors can interact with each other, follow a single set of rules and regulations, and have the same integrated technological and financial development and laws. Masood's conclusion is that the PSX integration provide investors and brokers

with a consolidated platform for trading shares, operating under a standardized regulatory framework (Masood, 2017).

2.7 The IPO Process in Pakistan Stock Exchange

The initial public offering is not something that just happens in a day or two. To achieve that milestone in a company lifetime, it has to go through a whole process of different steps that are aligned with laws and regulations of the specific stock market just like in our case with Pakistan stock market. As described by Ellis, Michaely, and O'Hara (1999), an important achievement for any company is the offering of stocks that can be traded publicly. Although the reasons behind doing an initial public offering (IPO) are clear, the process itself is intricate (Ellis, Michaely, & O'Hara, 1999). Zanib and Mumtaz (2021a) state that underwriters, auditors, investors, and regulatory bodies monitor companies that offer shares to the general public. Corporations must go through a series of stages to list on the stock market and offer shares, including filing applications, examining documentation, choosing underwriters, establishing pricing, publishing prospectuses, and undergoing audits by auditors. Adhering to these procedures in an efficient manner results in a shorter waiting period and reduces uncertainty and danger (Zanib & Mumtaz, 2021a).

The primary step of initiating the IPO process on the Pakistan Stock Exchange is the Appointment of Market Intermediaries as explained by the PSX. A company selects and engages with the appropriate market intermediaries, which include the consultant, share registrar, underwriter, SECP (Securities and Exchange Commission of Pakistan), PSX (Pakistan Stock Exchange), legal advisor, investment bank, bookrunner, and DST (Direct Settlement Technology)/investment agent (Securities and Exchange Commission of Pakistan, 2022).

After its establishment in 1999, Mumtaz and Smith (2021) shed light on the significance of SECP role in the listing process of initial public offering on the Pakistan Stock Exchange. SECP principally concentrates on implementing measures to promote the incorporation of companies into the stock market. Another crucial aspect of the SECP's duties as highlighted by Mumtaz and Smith (2021) is that it is responsible for conducting a comprehensive inquiry into any company that undergoes an initial public offering on the condition that the company has the ability to create future revenues and profits. The modifications implemented by SECP have established equitable conditions for companies to offer their shares to the general public. Mumtaz and Smith (2021) confirm this by pointing out an incident that occurred back in 2017 when the SECP introduced changes to the public offering regulations in order to facilitate the listing process.

The goal of adopting the revisions to the public offering regulations is to establish a fair price framework that will incentivize investors to participate in the public offering. The first step is to select an investment bank to advise it and perform underwriting functions in connection with the issue (Ellis, Michaely, & O'Hara, 1999). Underwriting is an arrangement through an underwriting agreement in writing between the issuer and the underwriter. The underwriter agrees to purchase the unsubscribed shares, if any, at the offer price. The underwriting reassures investors about the fairness of the offer price and assures the issuer of raising the necessary funds, even if the public does not fully subscribe to the issue (Initial Public Offering, 2017). Securities and Exchange Commission of Pakistan (2017) defines a "bookrunner" as a securities broker or scheduled bank that possesses a valid license from the Commission to function as an underwrite (p. 2). Therefore, the issuer of the

company shares must take these significant steps to appoint a bookrunner, underwriter, or banker to the issue during the initial phase of an IPO process.

After appointing the right market intermediaries, the second step is the IPO Prospectus which is the preparation of prospectus and listing documents by the CTI (Securities and Exchange Commission of Pakistan, 2022). The Securities and Exchange Commission of Pakistan (2017) provides us with the following precise definition of a prospectus in accordance with Pakistan Stock Exchange:

A "prospectus" refers to any written or visual material, such as a document, notice, circular, advertisement, or publication, that is used to offer or invite the public (or a specific group of people) to subscribe to or purchase securities of a company, corporation, or entity. This definition excludes deposits offered by banks and certificates of investments and deposits issued by non-banking finance companies. (p. 5)

The purpose of the prospectus preparation rules is to establish a uniform structure for the content, guarantee the precise disclosure of information, aid issuers, offerors, consultants, and advisors, and gather input from stakeholders to enhance the quality (Finance Division, Government of Pakistan, 2016). According to the listing requirements of the Pakistan Stock Exchange Main Board, choosing a consultant-to-the-Issuer (CTI) is a significant step, and a company should seek advice from various CTIs to assess their specialized knowledge and operational framework (Pakistan stock exchange, n.d.-f). The CTI prepares a chronological schedule and engages in discussions to determine CTI's appropriate compensation and further responsibilities, which include performing internal evaluations, exercising due diligence, creating a prospectus for listing, and also assisting in document and statement gathering (Pakistan stock exchange, n.d.-f). Section 9 of the Securities and Exchange Ordinance

of 1969 requires a firm to submit an application for listing on the stock market with a minimum paid-up capital of PKR 200 million (Mumtaz & Smith, 2021a).

Section 9 of the Securities and Exchange Ordinance of 1969 requires a firm to submit an application for listing on the stock market with a minimum paid-up capital of PKR 200 million (Mumtaz & Smith, 2019). Subsection (1) of Section 57 allows the submission of an application for the processing of new issues. The firm's shareholders have the option to apply for divestment as outlined in subsection 62(1) of the Companies Ordinance of 1984 (Mumtaz & Smith, 2021a). According to the Main Board (n.d.), the Pakistan Stock Exchange (PSX) and SECP approve companies listing applications, which can be submitted online through PRIDE, a platform designed to simplify the listing process. The PSX Listing Committee approves, and the SECP considers approving the prospectus (Pakistan stock exchange, n.d.-f). According to the Securities and Exchange Commission of Pakistan (2022), Pakistan Stock Exchange (PSX) and the Securities and Exchange Commission of Pakistan (SECP) have initiated the PRIDE (Public Offerings Revolutionized through an Integrated and Digitized Experience) online platform, which aims to streamline and accelerate the process of listing and applying for initial public offerings (IPOs). This system allows issuers and organizations to submit applications, interact with PSX, and receive updates, reducing processing delays and offering a comprehensive solution for all stakeholders, including advisors, issuers, and investors (Securities and Exchange Commission of Pakistan, 2022). The listing firm provides the SECP with the necessary paperwork and a draft of the IPO prospectus, which the Company Affairs Committee officially endorses after the SECP thoroughly examines and confirms their authenticity (Mumtaz & Smith, 2021b). The PSX provides the prospectus on its website for public

examination, allowing a seven-day window for feedback. Following this, the next step involves requesting dates from the PSX for the publication of the prospectus in newspapers, both in English and Urdu versions. It is mandatory for the prospectus to be issued, distributed, and published at least seven days prior to the start of the subscription period for each IPO (Securities and Exchange Commission of Pakistan, 2022).

Prospectus is required to be published in at least one Urdu language and one English language daily newspapers. Law allows publication of the prospectus in abridged form (Initial Public Offering (IPO), 2017). In their research, Mumtaz and Smith (2021b) thoroughly explain the process relating to IPO prospectus placement and publication. Once a firm fulfills all the essential requirements, the SECP authorizes the issuance of an IPO prospectus. After carefully examining the supporting documents, the National Clearing Company of Pakistan Limited (NCCPL) receives a formal solicitation to obtain a trading symbol. Mumtaz and Smith (2021b) also mention that after a company files an application with the SECP to obtain approval for the prospectus' issuance date, subscription date approval allows individuals to participate in acquiring new shares. After evaluating the proposal, the SECP determines its viability and sets the timelines for releasing the prospectus and receiving subscriptions (Mumtaz & Smith, 2021b). The public subscription period commences no earlier than seven days and concludes no later than thirty days after the prospectus is issued (Mumtaz & Smith, 2021b).

To make a wise investment decision, it is essential that an investor thoroughly read and understand the prospectus and the information given by the issuer. When contemplating an initial public offering (IPO), it is prudent to corroborate the

information, reports, assertions, and other disclosures included in the prospectus by consulting unbiased sources (Initial Public Offering (IPO), 2017). The CTI will collaborate with you to market your company in an active manner to prospective investors. They will provide support to the management team in their preparations for a formal roadshow consisting of a succession of investor presentations (Pakistan stock exchange, n.d.-f).

The next most important step includes listing and placement Listing is the act of registering a security or company on a securities exchange, allowing it to be traded. The exchange's official list includes the market price of the security and the name of the company. The listing offers a designated path for security holders to exit their positions (Initial Public Offering (IPO), 2017). The main characteristics of listing include display of the issuer's name and quotation of the market price of the security on the official list of the securities exchange. A company that is successfully listed has met all the relevant requirements of the Pakistan Stock Exchange as well as the Securities and Exchange Commission of Pakistan (SECP) as laid out in the PSX Rule Book, Public Offering Regulations, 2017, and the Securities Act, 2015 (Pakistan stock exchange, n.d.-g).

The listing process of IPOs varies across countries due to the regulators' policies in promoting the trading activities of the stock markets. The mandatory requirements for a company to get itself listed on the Pakistan stock exchange is explained by the Pakistan Stock Exchange (n.d.-g). , the Main Board which specifically addresses the listing requirements of large-cap corporations. The criteria for Main board mentioned in the Listing Guide (n.d.) is the company, registered with SECP, needs BOD approval for a public offering, minimum shareholder number of 500, and periodic QCR rated

financial statements audited additionally with a minimum requirement for the post issue paid-up capital of Rs.200 million. The annual listing fee criterium includes 1/10th of 1% of the paid-up capital (Pakistan stock exchange, n.d.-g). An initial public offering (IPO) is carried out through a public offer, which can be done using either the set price approach or the book building method (Pakistan stock exchange, n.d.-f). Publicly listed corporations are expected to fulfill two important ongoing responsibilities publishing an annual report and disclosing material information to the market (Pakistan stock exchange, n.d.-f).

Mumtaz and Smith (2021b) provide a glimpse of the post-IPO process. Investors engage in new offerings on the specified subscription date(s). Therefore, the PSX will announce if the issues have received more subscriptions than needed (oversubscribed) or less subscriptions than needed (undersubscribed). The procedure of balloting distributes shares to investors who have successfully applied for them when there is a surplus of demand. In the event that there is insufficient demand for the shares, the underwriters will purchase them. The underwriters gather the application for a no-objection certificate (NOC), the disbursement of funds, and the auditors' verification. Finally, the Central Depository Company (CDC) receives these shares, allowing investors to initiate trading through their CDC accounts. Following that, the corporation officially announces its inclusion in the media, and the CDC account enables the trading of initial public offerings (IPOs) (Mumtaz & Smith, 2021b).

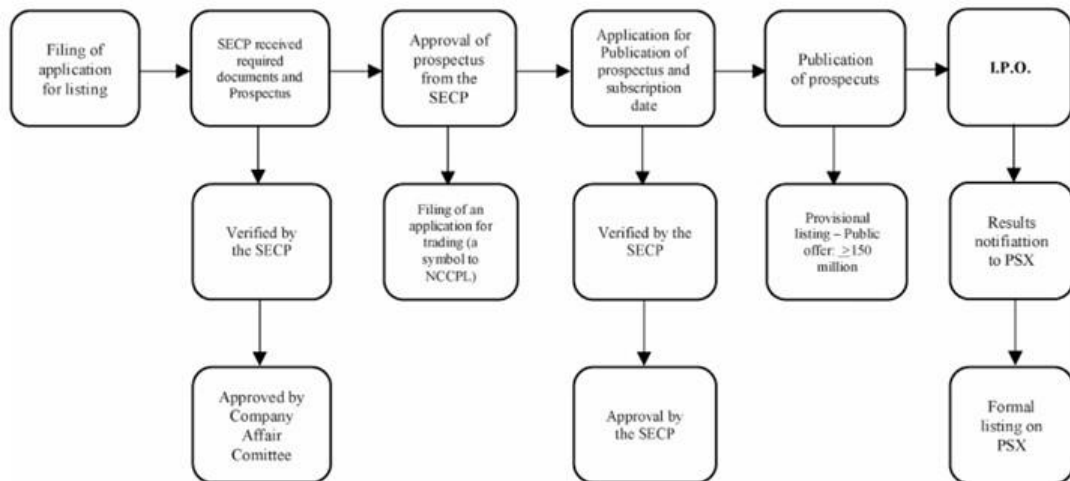


Figure 2: Flow Chart of the Listing Process of IPO in Pakistan

Chapter 3

COMPANY'S BACKROUNGDS, EMPRICAL METHODOLOGY AND RESULTS

3.1 Company's Backgrounds and their Unique IPOs

In Pakistan, Avanceon Digital Private Limited established itself as a private limited company on December 29, 2017. Later, on April 5, 2019, the firm changed its name to Octopus digital Limited, and one of its significant decisions was to go public and convert from private to public status. The company provides IT-enabled services, including online employee performance monitoring and tracking, online cost and production efficiency screening, online plant and machinery maintenance, online sales, and trading of related software and equipment (Business Recorder, 2023). Octopus Digital gives other strong businesses the chance to benefit from big data analytics at scale in a realistic way without having to pay for it up front.

With its headquarters in Lahore, Pakistan, Octopus Digital Limited is a subsidiary of the Avanceon Group, which owns 80% of the company. The public holds 12.3% of the company's shares, while the company itself holds approximately 1.96%. The company is not only growing in Pakistan, but it is also making significant strides in other regions of the world, including the US and the Middle East. Mutual funds and Modarabas own roughly 1.23 shares of the Octopus Digital (Business Recorder, 2023).

Octopus Digital first interacted with the Pakistan Stock Exchange (PSX) in September 2021, when it decided to become a public limited company and sell its shares to the public on the Pakistan stock market. Octopus Digital Limited achieved a significant milestone in the Pakistan stock market by becoming the most subscribed and the largest initial public offering in the history of the Pakistan Stock Exchange. On October 7, 2021, the PSX held a gong ceremony, and according to Mr. Farukh H. Khan, the management director of the PSX, Octopus Digital secured the fourth listing position for the fiscal year 2021-2022 (Pakistan Stock Exchange, 2021).

The most notable achievement for Octopus Digital was the oversubscription of its IPO more than 27 times, a significant step towards a successful IPO listing for a company seeking to go public. The BMA Capital served as the lead manager and bookrunner for the issue, significantly contributing to the surveys conducted for the IPO listing of Octopus Digital Limited (Pakistan Stock Exchange, 2021). The bookbuilding procedure led to the issuance of 27,350,000 common shares at a floor price of Rs 29/- per share. Bidders could submit offers for the entire issue size. However, only 20,512,500 shares, or 75% of the offer size, went to the successful bidders, while retail investors received the remaining 25%, or 6,837,500 shares. The firm received participation of Rs 30.249 billion against the issue of Rs 1.110 billion at the strike price of Rs 40.60 per share (Pakistan Stock Exchange, 2021).

In 2021, Octopus Digital Limited not only successfully launched its initial public offering (IPO) on PSX, but also secured numerous long-term high value contracts in Pakistan and the Middle East. In 2022, Octopus made significant strides in exploring new territories in Europe. Octopus Digital Limited used the funds it raised after going public to develop new products and platforms, particularly digital dashboard platforms

for manufacturing industries. The company also raised funds to cover its human resource expenses for sales and marketing groups (Pakistan Stock Exchange, 2021). Such a success for a company in PSX paved the way for other tech companies to also list on the Pakistan Stock Exchange.

In 2010, Airlink Communication Limited, a partnership firm in Lahore, Pakistan, underwent a transition to become a public company (Airlink Communication, n.d.). The company focuses on importing premium mobile brands, including Apple, Samsung, and Huawei, and assembling smartphones in Pakistan. Its mission is to become the largest distributor and retailer, aiming for a leading position in the telecommunications sector. Airlink Communication's mission focuses on establishing a robust network across Pakistan by delivering state-of-the-art services to its customers (Airlink Communication, n.d.). Airlink is a substantial organization that has been around for ten years, operating a statewide network of over sixteen hubs and regional offices, eleven thousand wholesalers, four thousand retailers, and after-sale support service centers in every major city in Pakistan. The company is an Apple Authorized Reseller and an official partner of notable global brands like Tecno, Samsung, Huawei, TCL, Alcatel, and iTel (Airlink Communication, n.d.).

Airlink Communication Limited's 2021 IPO garnered attention as the largest private sector IPO in Pakistan due to the substantial investment it collected through share sales. Airlink Communication secured approximately 6.43 billion PKR by issuing 90 million shares at a strike price of 71.5 PKR, establishing a record for private sector IPOs in attracting substantial investment upon its listing on the PSX (Siddiqui, 2021). The company employed the bookbuilding method and ranked as the seventh best IPO on the PSX in 2021, with 381 successful bidders out of a total of 518 (JS Global Online,

2023). Airlink witnessed an oversubscription of 1.8 times, whereas the retail segment saw an oversubscription of 1.19 times, suggesting a greater interest in the retail aspect of Airlink shares (JS Global Online, 2023). Airlink Digital primarily used the raised capital to meet its working capital requirements and enhance its sales activities (Siddiqui, 2021).

As of June 30, 2023, Airlink Digital Limited had 395.269 million outstanding shares held by 4,098 shareholders, based on the study of the shareholder distribution. Financial institutions, comprising banks, DFIs, and NBFIs, hold the remaining 5.56 percent of the company's shares, whereas sponsors own 73.43 percent, representing the largest shareholding (Business Recorder, 2024). Conversely, insurance companies possess 3.81 percent of AIRLINK shares, and the general public has 2.25 percent of the company's shares. The directors, their spouses, and their minor offspring own approximately 1.97 percent of the business's shares. Modarabas and Mutual Funds hold 1.34 percent of the company's share capital. Other shareholder groups possess the remaining shares of the corporation (Business Recorder, 2024).

This thesis examines the impact of an event on a company's stock price performance. An event study analysis will assist in assessing an event that maybe capable of impacting the stock price of publicly traded companies, either temporarily or over an extended duration. This event signifies the debut listing date of Octopus Digital Limited and Airlink Communication Limited on the Pakistan Stock Exchange. The designated dates for the event of this study are as follows: Octopus Digital Limited commenced trading on the Pakistan Stock Exchange on October 7, 2021, whereas Airlink Communication Limited began on September 22, 2021.

3.2 Data and Methodology

The event research methodology will be employed to analyze any underperformance or underpricing surrounding the date at which IPO was initiated to assess the short- and long-term performance of Octopus Digital Limited and Airlink Communication Limited. The empirical finance literature has adopted a specific methodology known as the "Event Study Methodology," which focuses on statistical tests to determine the significance of abnormal stock returns around the date of the event. The purpose of an event study is to evaluate the degree to which investors achieve excess or abnormal stock returns from an event that possesses new informational content (Sorescu et al., 2017).

This study for Octopus Digital Limited examines a short-run sample period from October 5, 2021 to May 25, 2022 and a long-run period from October 5, 2021, to February 20, 2024. The inaugural trading day on the Pakistan stock market is September 05, 2021. The short-run sample period for Airlink communication in this study spans from September 22, 2021 to May 12, 2022, while the long-run period extends from September 22, 2021 to February 20, 2024.

Our data encompasses Pakistan Stock Exchange, the KSE-100 index daily returns as the benchmark. This index is the most dynamic in Pakistan. We acquired the data from the Pakistan Stock Exchange website (<https://www.psx.com.pk/>) and EquityRT (<https://equityrt.com/>). The brief duration sample for octopus digital comprises 160 observations from 2021 to 2022, while the extended duration sample includes 592 observations from 2021 to 2024. The brief duration sample for Airlink Communication

comprises 160 observations from 2021 to 2022, whereas the extended duration sample includes 600 observations from 2021 to 2024.

3.3 The Short Run Performance Methodology

The first step in applying the event study methodology (ESM) involves identifying the event and determining its event window Ullah et al. (2021) defines the significance of the event window in their study. Determining the timeframe for evaluating the stock values of the sample companies implicated in this event is crucial. This is called the 'event window.' The event window may extend over several days, weeks, or months preceding and following the event date, depending on the sample size and the length of the event timeline. The event window is an essential element of the ESM, as it allows researchers to evaluate the impact of the analyzed event on stock returns. Although there is no set duration for an event window, it is advisable to keep it relatively brief to minimize the influence of unrelated events on post-event returns. Therefore, it is crucial for researchers to use their discretion when selecting an appropriate event window.

The specific moment when the event occurred, such as the inaugural trading day, should be considered. Mackinlay (1977) states that the primary goal of conducting an event study is to identify the event of interest and determine the timeframe for analyzing the stock prices of the enterprises involved in this event, using the event window. Mackinlay (1977) and Ullah et al. (2021) guide us in determining the event window. We designate the first trading date of the IPO as $T=0$. In the short-run methodology, we compute sample daily returns over two separate intervals: the initial period from $T = 0$ to $T = 20$, and the subsequent period from $T = 21$ to $T = 160$. This second phase is designated as the estimating period for forecasting the expected stock

return inside the event window. Understanding the event window and the complete chronology of an occurrence can be accomplished by analyzing the graphic illustrating the timeline of an event research.

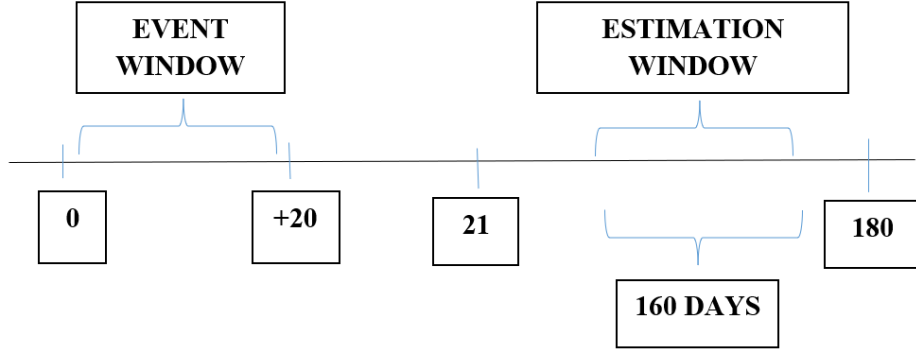


Figure 3:Timeline for an Event Study

We use the subsequent formula to calculate both the everyday stock returns and the everyday market index returns.

$$R_{m,t} = \frac{\ln(P_{m,t})}{\ln(P_{m,t-1})} \quad (1)$$

$P_{m,t}$ represents the closing price of the benchmark market index on date t, while $P_{m,t-1}$ denotes the closing price on day t-1.

This study utilizes the market model return methodology to calculate abnormal returns. The market model is subsequently employed for a more detailed analysis of the anomalous results. The market model is a statistical framework that correlates the return of a certain asset with the return of the market portfolio (Mackinlay, 1997). We derive the model's linear specification from the assumption of joint normality in asset

returns. In the market model, the beta risk of any asset is considered; nonetheless, it assumes a consistent linear relationship between market return and stock return (Mackinlay, 1997). The equation below is used for the calculations of the market model parameters (α and β) during the time period of the estimation window.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (2)$$

$R_{i,t}$ represents the return of stock i on day t ; $R_{m,t}$ denotes the market index return on day t ; $\varepsilon_{i,t}$ signifies the white noise error term or zero mean disturbance term. α and β are the parameters of the market model, with α being a constant term that quantifies the portion of normal return unaffected by market performance, while β denotes the systematic risk associated with the stock.

Hence, the abnormal return on day t for security i is calculated as follows. $R_{i,t}$ depicts the return of stock i on day t ; $R_{m,t}$ indicates the market index return on day t ; $\varepsilon_{i,t}$ represents the zero mean disturbance term which is an error term. α and β represent the characteristics of the market model by being the set of parameters for the model, where α represents a constant component that quantifies the standard return regardless of market performance, and β indicating the systematic risk associated with the stock. Thus, the anomalous return on day t for security i is calculated as follows.

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i \times R_{m,t}) \quad (3)$$

If the event window encompasses many days, the daily abnormal results are aggregated throughout the measurement frame to derive a cumulative value. Cumulative abnormal return (CAR) signifies the total incremental value contributed to the firm by the fresh information related to the event and provides comprehensive conclusions regarding the event of interest (Sorescu et al., 2017). The aggregation occurs in two dimensions: temporally and across securities. We will examine temporal

aggregation for a single security. The notion of cumulative abnormal return is essential for accommodating a multi-period event window (Mackinlay, 1997). The subsequent calculation validates the aforementioned concept and delineates the Cumulative Abnormal Return.

$$CAR(0, t) = AR_{i,0} + \dots + AR_{i,t} \quad (4)$$

The t-test is utilized to determine the statistical significance of the return that are abnormal in nature and either underpricing or overperforming is observed their following the event which can be the announcement of the initial public offering of the stock itself. This relates to a particular performance metric and is compared with its expected probability under the null hypothesis, which asserts that the unusual performance is equal to zero. Should the test statistic reach the crucial value at standard significance levels of ten percent, five percent or one percent the null hypothesis is dismissed. The t- statistic is computed as follows:

$$t - \text{statistic} = \frac{AR_t}{S(AR)} \quad (5)$$

the above equation the denominator is representing the standard deviation of the abnormal returns during the evaluation window. Cumulative abnormal return t- statistics is calculated as follows:

$$t - \text{statistic} = \frac{CAR_{t1,t2}}{S(AR) * \sqrt{T}} \quad (6)$$

The preceding equation's denominator represents the standard deviation of the abnormal returns, whereas the variable T in the equation denotes the length of the event window under investigation.

$$T = t_2 - t_1 + 1 \quad (7)$$

3.4 The Long Run Performance Methodology

Gur-Gershgoren et al. (2008) highlight on the significance of long-run event study analysis using the EMS. Long-term event studies, utilized to analyze equity market

behavior over one to five years post-significant corporate events (e.g., IPOs, SEOs, repurchases, and bond rating changes) have become increasingly vital in the finance literature. The most common way to measure both short-run and long-run abnormal return is the cumulative abnormal return (CAR) method. This method looks at cumulative periodic abnormal returns, which means it gives biased estimates of long-term investor experience (Gur-Gershgoren et al., 2008). We are often concerned with performance not only on the event date but also over prolonged durations preceding and succeeding the event. The conventional approach for assessing performance over prolonged durations is via cumulative abnormal returns, which compile abnormal returns from the commencement of the event period, t_1 , to time t_2 (de Jong et al., 1992).

In much of the research analyzing abnormal returns, the convention has been to aggregate either daily or monthly abnormal returns over time. We define the sample business's simple return for month t as well as its expected return for the same month. For the sample company, an abnormal return is defined as a simple return minus the expected return of the benchmark index, representing the abnormal return in month t . The aggregation across T periods results in a cumulative abnormal return (CAR) (Barber & Lyon, 1997).

In this model, the expected return for the stock during the event window is equal to the market return.

$$E(R_{i,t}) = R_{m,t}$$

Barber & Lyon (1997) state that the following equation can be used to summarize the daily abnormal returns using the market adjusted.

$$CAR_{t_1,t_2} = \sum_{t_1}^{t_2} (R_{i,t} - R_{m,t})$$

The left side of the equation displays the cumulative abnormal return across the time periods of t1 and t2, while the right part of the equation above enclosed in parenthesis reflects the return of a sample firm i at time t, less the return of the benchmark index at time t.

As indicated in the equation below, the t-test will be applied for the time periods across t1 and t2 in order to assess the null hypothesis. In this case, the cumulative abnormal return equals zero, which is the null hypothesis.

$$t - statistic = \frac{AR_t}{S(AR) * \sqrt{T}}$$

The aforementioned equation can be expressed as the abnormal returns of our estimation window divided by the standard deviation of those abnormal returns, multiplied by the square root of the duration of our event window. Additionally, the time period can be computed as follows for background calculations' = t2 - t1 + 1.

We should use WR which is the Wealth ratio in our calculations if we wish to observe and track all of the market reactions and their combined impact on the anticipated event. WR is calculated as follows.

$$WR = \frac{1 + (Average \sum_{t1}^{t2} R_{i,t})}{1 + (Average \sum_{t1}^{t2} R_{m,t})}$$

The last equation consists of average return of the market index for the time period (t1, t2) same as before. The practical interpretation of the results of this equation is Outperformance relative to the benchmark market index is indicated by a ratio greater than one. Underperformance relative to the market index, which serves as the benchmark, is indicated if the ratio is less than one. if not equal to one than it means no underperformance or outperformance was observed.

This section will analyze the long and short-term return performance results of Octopus Digital and Airlink Communication, providing a comprehensive explanation of the research findings. Following a comprehensive analysis of each company's results, we will conduct a comparative study to evaluate both firms and their respective outcomes.

3.5 The short-run performance of Octopus digital

Table 1 displays the findings of the MMAR for the period of event day 0 to event day 20 relative to the day IPO announcement is made which is Day 0, while Table 2 illustrates the cumulative abnormal returns (CAR) derived from the market model abnormal return. The market reaction results indicate a statistically significant positive abnormal return in the market model on the day when IPO is announced (Event Day 0: 9%, t-statistic: 3.68) and the subsequent two days (Event Day 1: 8.8%, t-statistic: 3.51; Event Day 2: 6.1%, t-statistic: 2.4). In a like manner, we also see statistically significant.

The returns on Days 3, 4, 5, 6, 8, and 12 were favorable. Day 3: 1.52%, t-stat: 2.29; Day 4: 10%, t-stat: 4.25; Day 5: 7%, t-stat: 2.78; Day 6: 10.8%, t-stat: 4.30; Day 8: 4.7%, t-stat: 1.87; Day 12: 6.9%, t-stat: 2.75. We see four statistically significant negative abnormal returns on Days 9, 10, 15, and 18. The negative and statistically significant abnormal return signifies the underperformance of the stock and the market reaction was not very favorable in those days.

Table 2 illustrates the utility of examining the CARs analysis across the time period of our event. The cumulative Abnormal return for CAR (0, +1) have significant threshold of 1% (t-stat: 5.08), CAR value of 0.18 which is positive meaning the stock of the

company outperformed the market expectations, along with the periods (0, +2) and (0, +3). Additionally, there was a statistically significant positive abnormal return at the 1% level (t-stat: 5.56, 6.38), with an elevated cumulative abnormal return (CAR) throughout these three days, culminating in a value of 0.42. The market responded well on event days 5 and 10 because favorable return is achieved during these days, achieving a CAR value of 0.53 with the level of significance taking place at 1% of value (t-statistic: 8.09 t-statistic: 6.4). Finally, we see that the ranges of 15 and 20 event day have high cumulative abnormal return values (0.50, 0.43), which means there is a significant positive abnormal return at the 1% level (t-stat: 5.01, t-stat: 3.80). All values are significant at the 1% level in the CAR table (Table 3) of MMAR.

Table 1:MMAR During the Event Window for Octopus Digital

Event Day	Market Mod. AR	T-Stat	P-Value	Significance Level
0	0.092	3.681711122	0.000318	1% LEVEL
1	0.088 1	3.513993459	0.000576	1% LEVEL
2	0.061	2.450718111	0.015348	5% LEVEL
3	0.078	3.130936263	0.002076	1% LEVEL
4	0.107	4.258571047	3.52E-05	1% LEVEL
5	0.0701	2.783956657	0.006026	1% LEVEL
6	0.1084	4.304972236	2.92E-05	1% LEVEL
7	0.0126	0.502320271	0.616142	
8	0.047	1.875723064	0.062538	10% LEVEL
9	-0.064	-2.579638158	0.010801	5% LEVEL
10	-0.066	-2.639629451	0.009132	1% LEVEL
11	-0.039	-1.569700008	0.118485	
12	0.0693	2.755266739	0.006554	1% LEVEL
13	0.006	0.251878429	0.801462	
14	-0.0185	-0.737361029	0.461996	
15	-0.04836	-1.92059776	0.056583	10% LEVEL
16	-0.0217	-0.863831728	0.38899	
17	0.0064	0.254680557	0.799301	
18	-0.0428	-1.701585021	0.0908	10% LEVEL
19	-0.014	-0.595026144	0.552677	
20	0.007	0.300541145	0.76416	

Table 2: Cumulative Abnormal Return of MMAR

Time Period	Value	T-stat	Significance %
CAR (0, +1)	0.181	5.088	1% LEVEL
CAR (0, +2)	0.242	5.569	1% LEVEL
CAR (0, +3)	0.321	6.388	1% LEVEL
CAR (0, +4)	0.429	7.618	1% LEVEL
CAR (0, +5)	0.499	8.091	1% LEVEL
CAR (0, +10)	0.535	6.417	1% LEVEL
CAR (0, +15)	0.505	5.015	1% LEVEL
CAR (0, +20)	0.439	3.809	1% LEVEL

Figure 4 below consist of y axis to be the returns and x axis to be the number of days of our event window. graph illustrates a favorable trajectory commencing on the first day possessing a value of 0.09, continuing till Day 7, followed by a decline to 0.49 on Day 11, indicating underperformance during that period. Subsequently, the value increases to 0.56 by Day 12, then decreases again by Day 14, after which a positive trend resumes, culminating on Day 17 due to favorable market reactions. Furthermore, the trend declines until Day 20, the final day of the event window, indicating underperformance throughout the period from Day 17 to Day 20.

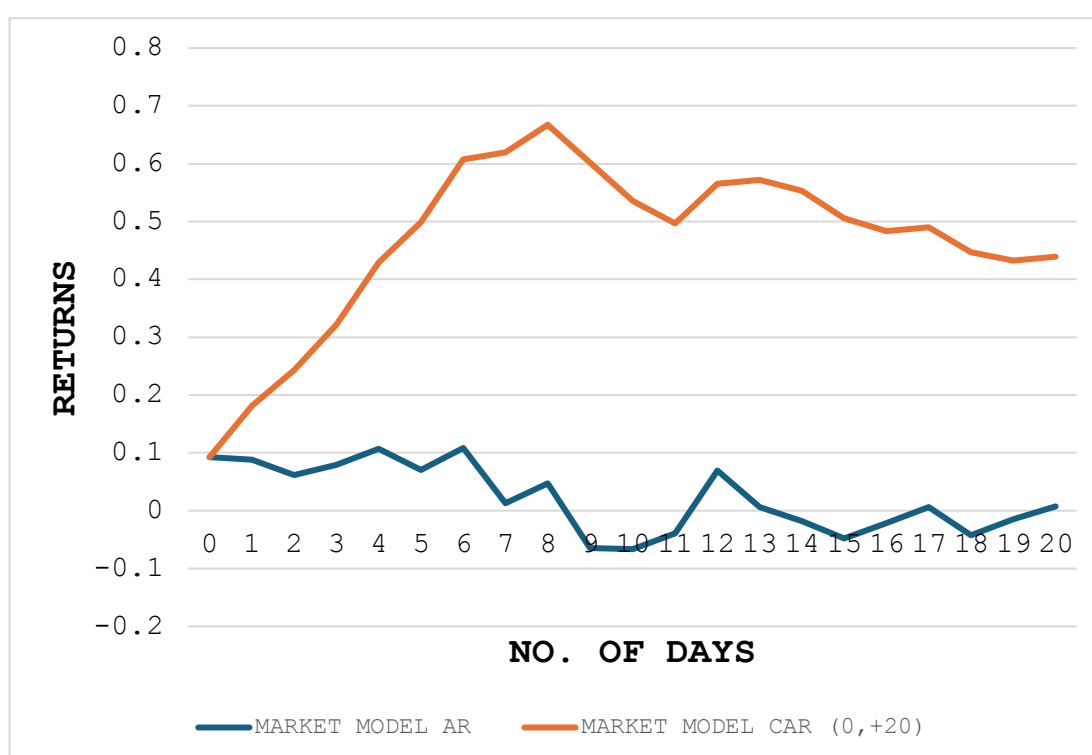


Figure 4: Market Model Abnormal Returns and Market Model CARs

3.6 The long-run performance of Octopus Digital

Table a 3 illustrates the impact of long-term CAR for market model returns. Furthermore, in keeping with our focus on long-term performance results, we have included the WR performance table 4 in our study. These tables display the CAR and

WR throughout several event windows, extending from (0, +6) months to (0, +2.5) years following the announcement of Octopus Digital's entrance to the Pakistan Stock Exchange.

For the first six months (0, +6), the market performance-adjusted positive cumulative abnormal return shows significance at the 5 percent level (t-stat: 2.37). Similarly, the MMAR cumulative abnormal return for the same six-month period also shows a positive outcome at a 5 percent significance level (t-stat: 2.11), indicating outperformance. Furthermore, the WR corroborates these findings, revealing an outperformance of 1.006, which exceeds 1 for the six-month duration. Conversely, with a WR of 1.002, the years (0, +1yr) have CAR values for both market-adjusted anomalous returns and market model returns that are not statistically significant; nonetheless, the WR value exceeds 1, albeit somewhat, at 0.002. Additionally, the year (0, +1.5) exhibits identical results to year 1, with a WR value of 1.001. This figure is not much greater than 1, as the difference is about 0.001, indicating no underperformance relative to the market benchmark. Furthermore, the periods (0, +2) and (0, +2.5) yield distinct outcomes. The WR value for the (0, +2) period is equal to 1, indicating neither underperformance nor overperformance in the long term from the perspective of the wealth indicator. However, an examination of the CAR results in both tables reveal insignificant negative values, which denote underperformance or poor performance in the market. Statistically significant negative abnormal returns at $\alpha = 1\%$ indicate that the cumulative abnormal returns (CAR) adjusted for the market over a long-term period of (0, +2.5) years are insignificant for the market model. Additionally, the WR value is less than 1, confirming poor performance during this timeframe. We can corroborate these findings with several scholars and experts

who assert that IPOs consistently underperform during the initial five years following their issuance, as discussed in our Conclusion section later.

Table 3: cumulative Long Run Abnormal Return of MAAR

Time Period	Value	T- Stat	Significance %
CAR (0, +6mths)	0.583060477	2.11363253	5% LEVEL
CAR (0, +1YR)	0.37330024	0.956883692	
CAR (0, +1.5YR)	-0.063789819	-0.133507795	
CAR (0, +2YR)	-0.856999579	-1.553339886	
CAR (0, +2.5YR)	-1.610361185	-2.628263748	1% LEVEL

Table 4: Wealth Indicator Results

WR (0, +6months)	WR (0, +1yr)	WR (0, +1.5yr)	WR (0, +2yr)	WR (0, +2.5yr)
1.006319173	1.00295453	1.001421379	1.00019831	0.99987809

3.7 The short-run performance of Airlink Communication

Relative to the first day of trading (Day 0), Table 5 shows the market model's abnormal returns over the range of 0 to +20, and Table 6 shows the cumulative abnormal returns for several sub-periods during the event window. On the first day of trading, the market reaction result shows a statistically significant positive abnormal return (Day 0: 9%, t-stat: 4.50) and there are positive abnormal returns on Day 1 and Day 2 but the market reactions are statistically insignificant (Day 1: 1.1%, t-stat: 0.53; Day 2: 1.3%, t-stat: 0.62).

The abnormal returns from Days 3 to 20 are typically unfavorable. On Days 3, 4, 6, 8, 9, 11, 13, 14, 17, 18 and 19, negative abnormal results are found lacking statistical significance. Similarly, on days 5, 7, 10, 12, 15, 16, and 20, positive abnormal returns are found and they are all statistically insignificant. In other words, statistical

insignificance means that the abnormal market reaction does not exist. values, On Day 19, we observe a statistically significant negative abnormal return of -4.8%, with a t-statistic of -2.36. The negative and statistically significant abnormal return indicates underperformance only on that day relative to the market.

Table 6 presents an analysis of the CAR analysis result during the time period of our event. The CAR value for the day (0, +1) holds the significant level of 1% (t-statistic: 3.56), having a positive CAR value of 0.103 (10.3%). Similarly, the cumulative abnormal periods (0, +2), (0, +3), (0, +4) and (0, +5) have statistically significant cumulative market reactions and have values of 0.115, 0.100, 0.080, and 0.082 respectively. However, the cumulative abnormal periods (0, +10), (0, +15), and (0, +20) have statistically insignificant cumulative market reactions. The positive cumulative abnormal returns from the first trading day to Day +5 show empirical evidence for underpricing in Airlink Communication IPO. The market overreacts till Day +2 and then corrects itself to a level of around 0.082 cumulatively on Day +5.

Table 5: MMAR During the Event Window

Event day	Market Mod. AR	T-stat value	P-value	Significance level
0	0.092	4.508	0.000	1% LEVEL
1	0.011	0.532	0.596	
2	0.013	0.623	0.534	
3	-0.016	-0.774	0.440	
4	-0.020	-0.960	0.339	
5	0.002	0.076	0.939	
6	-0.015	-0.718	0.474	
7	0.013	0.635	0.526	
8	-0.005	-0.232	0.817	
9	-0.007	-0.364	0.716	
10	0.014	0.701	0.485	
11	-0.010	-0.501	0.617	
12	0.007	0.331	0.741	
13	-0.015	-0.729	0.467	
14	-0.007	-0.322	0.748	
15	0.014	0.690	0.491	
16	0.010	0.485	0.628	
17	-0.027	-1.302	0.195	
18	-0.009	-0.425	0.672	
19	-0.048	-2.364	0.019	5% LEVEL
20	0.007	0.334	0.739	

Table 6: Cumulative Abnormal Results

Time Period	Value	t-stat value	p-value	Significance level
CAR (0, +1)	0.103	3.563	0.000	1% LEVEL
CAR (0, +2)	0.115	3.269	0.001	1% LEVEL
CAR (0, +3)	0.100	2.445	0.016	5% LEVEL
CAR (0, +4)	0.080	1.757	0.081	10% LEVEL
CAR (0, +5)	0.082	1.635	0.104	10% LEVEL
CAR (0, +10)	0.082	1.214	0.227	
CAR (0, +15)	0.071	0.874	0.384	
CAR (0, +20)	0.071	0.049	0.961	

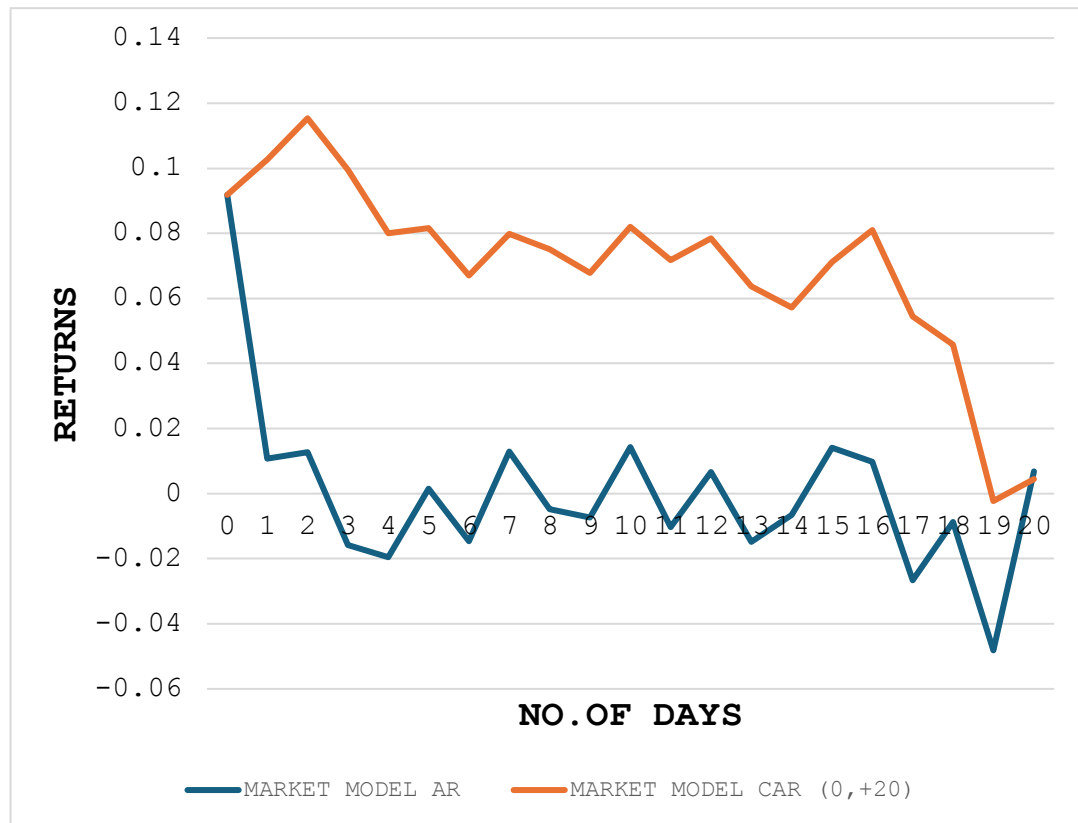


Figure 5: Market Model Abnormal Returns and Market Model CARs

Figure 5 consist of the y-axis which is the returns and x-axis which are the days of our event window. It illustrates a positive cumulative anomalous return trajectory commencing on Day 1 with a value of 0.09, persisting until Day 2 (0.12) followed by a decrease to 0.082 on Day 5, showing initial overreaction and then correction till Day +5. Subsequently, the cumulative abnormal return follows a stable return around a value of 0.080 till Day +16 and then, has a downward trend till Day +19 with a final value of 0.005 on Day +20. However, it should be noted that the CAR for the event window period (0, +5) is statistically significant with a value of 0.082.

3.8 The long-run performance of Airlink Communication

Table 7 shows the results of long-term CARs. Additionally, to align with the emphasis on long-term performance analysis, Wealth Ratio results are shown in Table 8. These

tables show the Cumulative Abnormal Returns (CAR) from 0 to +6 months and the Wealth Ratios (WR) from 0 to +2.5 years.

During the initial six months (0, +6), the cumulative abnormal return has no statistical significance even though it has a cumulative abnormal return of 0.117. The WR indicates an underperformance of 0.998, which does not surpass the critical value of 1 over the six-month period. The same empirical observation holds for the cumulative abnormal return periods of (0, +1yr), (0, +1.5yrs), and (0, +2yrs) as well as for the respective WR results. The WR results show slight underperformance till +2yrs. However, the long-term period of (0, +2.5yrs) has different result. The WR value for the (0, +2) period is not equal to 1, suggesting underperformance; however, the WR for the 2.5-year period equals 1, signifying neither an underperformance nor an overperformance in the long run from the wealth indicator's standpoint. However, a closer look at the CAR result for the period (0, +2.5yrs) shows a statistically significant cumulative return of 1.055 (105.5%). This result indicates that between Years +2 and +2.5, the company has outperformed the market significantly. The cumulative abnormal return between Year +2 and Year +2.5 is 0.887 (88.7%/t-value:3.98) indicating a significant outperformance over this period. Similarly, the WR result is above 1 with a value of 1.006. In summary, for the period (0, +2.5yrs), outperformance is found but this results from the significant upturn during the last six months. For the first two years, there is empirical evidence supporting underperformance.

Table 7: Cumulative Long run Abnormal Returns

Time Period	Value	t-stat value	p-value	Significance level
CAR (0, +6 months)	0.117	0.526	0.599	
CAR (0, +1yr)	0.079	0.250	0.803	
CAR (0, +1.5yrs)	-0.044	-0.113	0.910	
CAR (0, +2yrs)	0.168	0.376	0.707	
CAR (0, +2.5yrs)	1.055	2.115	0.036	5% LEVEL

Table 8: Wealth indicator Results

WR (0, +6months)	WR (0, +1yr)	WR (0, +1.5yrs)	WR (0, +2yrs)	WR (0, +2.5yrs)
0.998	0.998	0.997	0.998	1.000

Chapter 4

CONCLUSION

This research examines the IPOs of Octopus Digital and Airlink Communication, highlighting the long-term and short-term anomalies in stock returns for each firm listed on the exchange from 2021 to 2024. We perform event research on the everyday returns of the firm in question from 2021 to 2024. In the preceding chapter, we utilized the efficient tools inherent in the event study methodology, which illustrated that the short-run performance abnormal returns were more advantageous for Octopus Digital compared to Airlink Communication. Events that occur during the procedure of an initial public offering are directly correlated with and trigger anomalies, such as underperformance and overperformance of the IPO price value.

Octopus Digital IPO short-term analysis indicate less short-run underpricing of IPOs on the Pakistan Stock Exchange and more outperformance from 2021 to 2024 according to market model abnormal return values. Both the short-run and long-run performances are based on the market model. The analysis of 160 trading days revealed initial significant positive returns, accompanied by a rise in CAR values within the initial 20 days of trading. Consequently, we may deduce that the market is reacting positively to the launch of the Octopus Digital IPO on the Pakistan stock exchange but for some days between day 9 to day 18 we observe significantly negative Octopus Digital IPO short-term analysis indicate less short-run underpricing of IPOs on the Pakistan Stock Exchange and more outperformance from 2021 to 2024

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The findings of the Airlink Communication IPO's short-term performance indicate that short-run underpricing of IPOs exists a lot more on the Pakistan Stock Exchange from 2021 to 2024 as compared to Octopus Digital. Utilizing the MMAR to assess both brief and extended period performances, the study covered 160 days of trading, demonstrating returns of the initial period. and a subsequent rise in positive CAR values over the first five trading days, as previously presented. Consequently, we can deduce that the market exhibits an overreaction until day 2, subsequently correcting itself around day 5. Furthermore, the downward trend observed from day 16 to day 20

suggests that the market is not advantageously disposed towards the introduction of the Airlink Communication IPO on the Pakistan stock market.

All these data are consistent with our market model. The initial public offering of Octopus Digital yields positive abnormal returns for investors in the short term and we also observe underpricing in Octopus digital. Conversely, Airlink Communication experiences adverse market reactions in the near term, as big movements are lacking due to little outcomes on most trading days.

The analysis demonstrates evidence of underperformance and Underpricing and a correlation between long-term returns for the Octopus Digital and Airlink Communication initial public offerings. Long-term evidence indicates that from 2021 to 2024, octopus IPOs demonstrate outperformance over the initial protracted period, accompanied by occurrences of underperformance and neutrality, as previously observed. In contrast, the Airlink IPO exhibits long-term outperformance; yet, empirical evidence also reveals underperformance, as elaborated in the previous chapter.

The long-term performance of the model IPOs for Octopus Digital and Airlink Communication is evaluated over a duration of two and a half years from the listing date utilizing two methodologies: vehicle and WR vehicle serve as instruments for signaling any fluctuation in the valuation of the IPO price. The trading period of 0 to 6 months shown exceptional performance for Octopus Digital, as indicated by a WR car surpassing 1 and a cumulative abnormal return of 2.11, which is favorable. Subsequently, over a period of 2 to 2.5 years, the corporation begins to exhibit signs of a deleterious decline in its values, as evidenced by the second year's performance,

which recorded a reduction of -1.61, indicating subpar performance. Conversely, Airlink Communication demonstrated subpar performance, indicated by a weighted cumulative abnormal return of less than 1, with a cumulative abnormal return value of 0.117, which was statistically insignificant. In contrast, over the subsequent eighteen months to two years, we find indications of long-term underperformance; yet, between two and two and a half years, the company starts to demonstrate anomalous results. The evidence of the value -0.23 observed in the second year indicates a deleterious drop, leading us to conclude that the company had substandard performance during this period. Only after the first 2 years Airlink Communication shows outperformance. Initial public offerings, notwithstanding their intrinsic risks, typically underperform market indices in the years immediately following the offering. This phenomenon can be ascribed to the initial market price being inflated by considerable divergence of opinion, succeeded by a gradual reduction in this gap over time. Eventually, the valuation of the price-setting marginal investor aligns with that of the typical investor. Miller (2000). Hence, we can conclude that octopus digital showed poor long-term performance later after the 2 years but was received positively in the initial years. Whereas Airlink Digital showed underperformance in the first 2 years compared to Octopus Digital Airlink Communication was not received with same positive market reactions leading us to say that Airlink Communication showed more underperformance amongst the two during the Long-term.

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