

**Intra-Industry And Economic Consequences Of Initial Public Offerings In  
Pakistan**



By

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## **DEDICATION**

This thesis is especially dedicated to my mother for her love and support, and to my father who is not among us today

It's my pleasure to dedicate my thesis to the people who really are the cause of my success. They include my parents, teachers, wife and my friends whose support given me the confidence of believing in myself and becoming able of completing this degree.

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## ABSTRACT

IPO is an event which offers the firm's ownership to the general public by purchasing IPO firm's shares and in return contributing funds to fulfill its financial needs. The purpose of the present study is twofold; first the study examines the impact of IPO events on already existing firms operating within the same industry and second to see the relationship between IPO activity and external factors (both market and economy) prevailing in the Pakistan's environment. A sample of 90 newly listed firms (IPOs) and 337 existing firms (rival firms in the industry where IPO take place) belongs to Pakistan Stock Exchange (PSX) from 19 different industries have been taken which covering a time span of 1998 to 2016. The performance of industry counterpart has been analyzed through the proxies namely; operating performance (ROA & ROE), stock returns (CAR & BHAR), Leverage (Debt to Asset), Liquidity (Working capital ratio), volatility (Standard Deviation), Industry competitive environment (HH Index). In the first phase, the study examines the intra-industry impact of IPO event by comparing pre and post-performance of other firms operating in the same industry where IPO event take place by applying t-test. In the second phase, a performance comparison has been made between IPO firms and its industry competitors after the IPO event. Then an inter-industry impact of IPO events is examined by making a comparison among industries and see which type of industry is more affected through IPO event. In the last step, the study sees how IPO event bring changes in the external factors like (Stock market and macro-economic variables).

The results indicate that existing firms operating performance ROA and ROE, stock returns (both in short and long run) and Liquidity decline after the event of IPO. In addition, rival firms leverage position incline towards more debts which is again a bad sign for rival firms in terms of more debt burden and financial risk. Herfindahl Hirschman index (HHI) is applied to see changes in industry composition in pre and post IPO event. Overall industry concentration is found as significant and negative which shows IPO helps in declining the industry concentration and discourage monopolistic competition. When comparing IPO firm with its industry counterpart in terms of performance efficiency up to 3 years after the IPO event, industry competitors outperform IPO firm in terms of operating performance (ROA, ROE), however, IPO firms performed better in terms of leverage and short term liquidity position. A multivariate regression analysis shows a significant decline in rival firm operating performance (ROA, ROE) and liquidly whereas leverage position of rival firms are



also affected negatively as firm debt burden shown an upward trend. IPO inter-industry comparison has been made while comparing different sectors performance by applying reference dummies. The results indicate that existing firms working in Oil & Gas from non-financial and commercial banks from financial sector are more affected through IPO event.

The second part of the study analyzes the existence of long run relationship between IPOs and external factors like Foreign Direct Investment (FDI), Industrial Production (IP), Interest Rate (IR), Stock market index and trading volume. The study applied ARDL to find the association between number of IPOs and external factors. The results indicate GDP, IR and FDI shown a positive and significant relationship with number of IPOs whereas Stock Market Trading volume, Market index and IP did not associated with number of IPOs.

Overall the study has theoretical, practical and policy implications. It confirms both supply and information effect which create negative impact of rival firms after the IPO event. The study suggests individual investors and portfolio managers to retain existing firm shares (in short) if firms belong to Oil & gas, Chemical, Food & personal care and Technology & communication, as they provide positive returns to existing firms after the IPO event. On the other hand, firms belong to Financial, Engineering and Textile sector show negative impact of IPO therefore it is beneficial for investors to buy IPO firms shares after the event. In long run, only Oil and gas sector offer positive returns whereas Chemical, Financial, Engineering, Food & personal care and Technology & communication offer negative returns to existing firm's shares after the IPO event. IPO event also decrease industry concentration and industries move from monopolistic to perfect competition, except, cement, textile, fertilizer and investment bank. The possible reason for the positive concentration is due to more merger and acquisition in these sectors that results in increase the degree of concentration after the IPO event. With reference to number of IPOs and external factors, the results indicates that IPO event is more associated with growing economic needs as compared to stock market needs. This further confirms the previous notion of the researchers that there is no association between stock market growth and economic growth.

**Keywords: IPO, Rival Firms, CAR, BHAR, HHI, ARDL, FDI, Interest Rate**

## PUBLICATIONS FROM RESEARCH

During the PhD program, the researcher published the following research articles in the Y category journals recognized by the Higher Education Commission (HEC) of Pakistan:

1. Khadim, M. I., & Babar, S. F. (2021). IPO Intra Industry Effects on Peer Firm's Earnings, Composition and Stock Returns. *Global Economics Review*, VI, 41-48. (Y-Category Journal)
2. Rafique, A., Quddoos, M. U., Khadim, I., & Tariq, M. (2020). Financial and Operating Performance of Initial Public Offerings in Pakistan. *iRASD Journal of Economics*, 2(1), 35-42. (Y-Category Journal)
3. Bilal, M., Khadim, M. I., Shafi, H., Humayon, A. A., & Khan, N. (2019). Roles, Responsibilities, And Hindrances Of Chief Risk Officer In The Risk Management Framework For The Banking Industry Of Pakistan: A Qualitative Approach. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies* (Y-Category Journal)
4. Khadim, M. I., & Babar, S. F. (2017). Intra-Industry Impacts of Initial Public Offerings: Evidence from Pakistan Stock Exchange. *Journal of Managerial Sciences*, 11. (Y-Category Journal)

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## **List of Abbreviations**

AIM	Alternative Investment Market
AR	Abnormal Returns
ARDL	Autoregressive Distributed Lag
BHARs	Buy and Hold Abnormal Returns
BOCHK	Bank of China Hong Kong
CAPEX	Capital Expenditure
CARs	Cumulative Abnormal Returns
CBA	Common Wealth Bank of Australia
COGs	Cost of Goods Sold
CUSUM	Cumulative Sum of Squares
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
EBA	Extreme Bounds Analysis
EPS	Earnings Per Share
FTC	Flotation Cost
GDP	Gross Domestic Product
HF	Hedge Funds
HHI	Herfindahl-Hirschman index
IPO	Initial Public Offering
LASSO	least absolute shrinkage and selection operator
L-MRQAP	Longitudinal Multiple Regression Quadratic Assignment Procedure
LOT	Lot Size
OLS	Ordinary Least Square
OST	Oversubscription Times
PCA	Principal Component Analysis
PIC	Post IPO Capital
PSx	Pakistan Stock Exchange
R&D	Research & Development
REIT	Real Estate Investment Trust
ROA	Return on Assets
ROE	Return on Equity
SECP	Securities and Exchange Commission of Pakistan
SMEs	Small & Medium Enterprises
SOE	Seasonal Equity Offerings

# **CHAPTER 1**

## **INTRODUCTION**

Initial Public Offering (IPO) is considered as the most noteworthy event in a firm's life. It attains a considerable attention from public; including both individual as well as institutional investors. IPO is a process where firm offering its shares (for sale) to general public for the first time and there is no existing public market for the stock before IPO (Zheng & Zhong 2017). IPOs are mostly done for raising capital, to monetize the investments of existing investors, and to turn out to be publicly traded enterprises (Amor & Kooli, 2017).

The aim of the present study is to find the intra industry impact of an IPO event on already existing firms (rival firms) in the industry. When an IPO event take place and firm go public for the first time, it has certain consequences for both IPO firm and the firms which already exist in the industry. From IPO firm's perspective, the management of IPO firm will decide to go public when it foresees favorable industry prospects. It can be taken as a sign of growing needs of finances to meet market growing demands for products or services for a particular industry. IPO firm has some competitive advantages over its rival firms as it has access to fresh capital at low cost as compared to debt financing. This improve their ability to enhance their production output, hired more qualified employees and go for acquisition of other firms.

The firms already operating in the industry (rival firms) can take this event in either way that is positive or negative. If IPO firm decide to go public when its offerings indicate the favorable industry prospects then it will create a positive impact on already traded firms in the industry. The IPO event may also have negative consequences for rival firms. One argument regarding IPO proceed is to allow new entrant that will reduce the sales and profit margins of the rival firms or pull the market share from the existing firms which results in decline in their

performance. All these factors suggest that IPO can have some affects whether positive or negative on rival firms and it can alter overall industry dynamics.

### **1.1 Background of the Study**

When firm decide to go public, it exposes in to many challenges (costs) like legal requirements, information disclosure and public participation in ownership but at the same time reaping the benefits of access to capital market for excess funds. Moreover, it would only be possible if a company has enough funds to conduct such events because IPO itself is a costly process as compared to other forms of external financing. Therefore, the companies try their level best to generate enough funds which not only meet the cost of IPO but also generate sufficient funds for its future needs. Some IPOs received massive media coverage Google in 2004, Groupon in year 2011 and Face book IPO in year 2012 which exhibit the growing importance of such events for investors (Peller, 2013). Initial Public Offerings is beneficial for the issuing company as well as for investors who actively involved in the process of IPO (Peng, Jia, Chan, 2022). In addition, it is important event for many other stakeholders of IPO firm like investment banks, already listed firms in same industry and other financial institutions involved in IPO process (Packer and Spiegel, 2020). Initial public offering also required an effective planning from firm's management and IPO agents i.e. underwriters to decide about its timing, process and size, as all such dimensions throw some signal to other stakeholders, which eventually decide about success or failure of IPO (Eckbo, & Norli, 2005).

IPO also provide an avenue to public firms to generate funds through equity offering to general public which is not available to every type of firm. In Pecking Order Theory, Myers and Majluf (1984) has given equity offering as last priority of funds generation for a firm. However, the recent research opposed this fact and proved the importance of external finance over internal one and in the same passion proved the significance of equity finance

over debt finance. They argued that debt issues are often less than equity issues and the equity issues tracking financing deficiencies more efficiently than debt financing (Frank & Goyal, 2003). Moreover, equity financing increase firm's tendency towards mergers and acquisitions, gain market share and acquiring economies of scale.

Developed economies like US have 6 million registered firms with 20,000 big firms which share 53% of total employment provided by these firms (US Census Bureau)<sup>1</sup>. China has 34.8 million registered firms and has 10 large industries which produce 35% of jobs<sup>2</sup>. Regionally India registered more than 20 and Iran 1.6 million registered firms. Whereas Pakistan registered only 194000 firms out of which more than 95000 firms in last 5 years<sup>3</sup> with 524 listed firms. While making a comparison in conducting IPOs, US and China conducted 435 and 510 IPO per annum in last 5 years. Regionally Pakistan conducted 5 IPOs per year as compared to India which conducted 32 IPO per year in last 5 years.

The reason for this sluggish pace of economy and poor corporate sector performance is due to serious securities, political and economic issues faced by Pakistan from two decades. Politically, there is a lack of continuity in the policies of the governments which leads to the deterioration in economic progress of the country. This political instability not only shakes the confidence of individual investors but also the institutional as well as the foreign investors. The size of Pakistan's economy does not cross a certain limit where it needs more funds and companies gone for equity financing. One of the key success features of developed economies is having a sizeable corporate sector with huge number of registered companies. Moreover, the social factors also involve in less number of IPO event. Mostly private limited firms owned by families and they do not want to share the ownership to the outsiders. Transparency is another issue which is facing by the Pakistan's economy. There are lot of researches which shed light on the political instability which leads to economic instability in Pakistan. They

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<sup>1</sup> US Census Bureau

<sup>2</sup> IBIS World

<sup>3</sup> SECP

argued that on one side PSX counted as one of the leading stock exchange with high liquidity and growth but at the same time also facing huge volatility due to political instability leads to economic instability (Ghani et al., 2022; Irtiza et al., 2021 and Joyo, Shafique, & Lefen, 2019). There are also researches which shed light on the connect of economic and stock market (Ahmad & Ramzan, 2016; Ghani et al., 2017).

The performance of IPO firm is also documented by many researchers in Pakistan. Mumtaz and Ahmed (2016) reported the decline in IPO firm's performance after the IPO event in Pakistan. In another study Mumtaz and Yoshino (2021) reported the impact of greenness on post IPO performance. They came up with the findings that there is a negative relationship between greenness and initial returns and underperformance of IPO. Sohail and Anjum (2016) found that firms after acquiring additional fund through IPO do not improve their efficiency in three years post IPO event.

## **1.2 IPOs in Pakistan**

Pakistan Stock Exchange (PSX) provides the primary market to firms for IPOs issues. Previous it was divided in to three stock exchanges that is Karachi Stock Exchange (KSE), Lahore Stock Exchange (LSE) and Islamabad Stock Exchange (ISE). Among three KSE were the biggest and the most important one. It started its operations in 18<sup>th</sup> September, 1947 just after the independence of Pakistan as a company limited by guarantee with five trading firms and total of Rs. 37 million as paid up capital. From the date of initiation till 1991 a KSE 50 index was used which was later raised to KSE 100 index. In January 2016 all three stock exchanges were merged into one named as Pakistan Stock Exchange (PSX). It has also change its status from company limited by guarantee to company limited by shares. PSX is considered as a highly volatile market. From year 2000 to 2008 it has shown a remarkable performance and attained the status of emerging market which was decline after economic

recession of 2008. However, in the post-recession periods it again picked continuous momentum and crossed a barrier of 50000 points on 24<sup>th</sup> January, 2017. Now a days PSX is considered as a good investment plat form for both individual as well as institutional investors beside poor political and economic situation in Pakistan.

The process of IPOs in Pakistan started after few years of the independence of Pakistan. Karachi Electric Supply Corporation was the first one to list itself as Public Limited Firm on 2<sup>nd</sup> April, 1949. M/S Hussain Industries listed themselves in 1953 through IPO and also the first one which issued prospectus before the IPO. From 1953 up to early 90s the pace of IPOs in Pakistan was very slow due to various political and security issues. In Pakistan the progress of IPO registration was not came in to lime light until financial liberalization policy was adopted by the government in early 90s. Due to government reforms, process of deregulation and privatization of industries increased which paved the way for initiation of smooth running of capital market that results in increase in the pace of IPO registration. This provides an opportunity to private corporations to expand their ownership structure, increase their financial resources and avail exit strategies like merger and acquisition. From year 1991 till 1996 a large number of IPO issued and this was the time when it realized to abolish Corporate Law Authority (CLA) (which was previously monitored the matters regarding IPOs and listed companies) and established a new authority in 1997 with the name of Securities and Exchange Commission of Pakistan (SECP).

#### **1.2.1 IPOs listing process in Pakistan<sup>4</sup>**

In IPO process general public share the ownership for the first time in IPO firm according to their size of investment. There are regulatory bodies which monitor the process of IPO in every country. In Pakistan the regulatory body is Security and Exchange Commission of

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<sup>4</sup> Pakistan Stock Exchange

Pakistan (SECP). To enlist in stock exchange and conduct an IPO, a firm is strictly adhere the listing rules, related provisions of the Companies Act 2017 and issuance of capital rules 1996. In order to register an IPO in the Stock Exchange a firm is required to submit an application in accordance with Security and Exchange Act 2017, under section 9. For main board (large firms) the requirement of paid up capital is Rs.200 Million, whereas Small and Medium Enterprise can go for IPO with the paid up capital of Rs. 25 million only. For newly issued IPO application is submitted under section 57 (1), to going from private to public application will be submitted under section 62(1). If initial application is accepted then further formalities will be completed with the mutual agreement of respective stock exchange, which includes prospectus publication, bidding time frame for book building process and time required for public subscription. The time frame for public subscription is started after 7 days of the issuance of prospectus and will not go beyond 30 days. For the allotment of trading symbol the application is forwarded to National Clearing Company Limited (NCCL). In order to find the over or under subscription of the shares application, the investor's applications are counted on the day of subscription to find out how much application has been received against bidding. In case of over-subscription, balloting will be conducted for the allotment of shares to applicants whereas; in case of under-subscription underwriters have to subscribe the shares. Then the firm request to underwriters for the issuance of no objection certificate (NOC), release of funds and allocation of auditors. Then the shares of IPO firm will be transferred to Central Depository Company which is government approved custodian of shares in Pakistan. Afterwards subscribers are allowed to start trading with their CDC accounts. The IPO firm is also required to advertise the listing information in the newspapers.

Formal listing process of IPO firm is mentioned below:

1. A paid up capital of 200 Million PKR for main board firms and 25 Million for SME firms.

2. Minimum 500 hundred subscribers are required for IPO, otherwise process will be stopped there. IPO firm allowed to offer maximum 5 % shares to its employees and 25 to Pakistanis living abroad.
3. In case of big firm having paid up capital of 500 million PKR, 25 % shares will be offered to general public.
4. In case a firm has paid up capital of more than 500 million PKR, 12.5 % or 1250 million PKR shares will be offered to general public.
5. IPO firm also publish a prospectus for offering capital to public under section 6 of listing rules.
6. If book building process is opted for IPO, then firms should publish all the information related to IPO in prospectus in accordance with Companies Act 2017, along with the disclosure of strike price.
7. The time frame for prospectus is minimum 7 days and maximum 30 days after subscription date with one English and one Urdu newspaper.
8. The application for subscribers received from nominated bankers mentioned the prospectus
9. The offering management and directors of the firm are not allowed to take part in subscription process.
10. The firm requires to disclose the name of successful applicants after 10 days of subscription.
11. IPO firm get clearance of its documents form PSX followed by SECP.
12. IPO firm should fulfill the requirements of PSX and SECP related to listing.
13. If shares are allotted to sponsors more than 25 % as pre IPO placement then they are bound to retain their shares minimum 6 month from the date of subscription and not offer for sale.
14. For clearance of documents PSX require 15 to 21 days.



15. The dates for public subscription and publication of documents related to IPO will allow after approval from SECP.
16. IPO firm will be listed in PSX after 30 days of subscription date.
17. Listing fee will also be paid annually which change from time to time and available with PSX and SECP.

### **1.2.2 Offering Methods of IPOs <sup>5</sup>**

There are two methods follows in offering of IPOs in Pakistan; Fixed Price method and book Building Method. Fixed price method is the older one which is still popular in the world whereas Book building method was introduced in 2010 to further enhance IPO process.

In fixed price method, offer price will be decided after analyzing firms financial reports and due diligence. The investment bank act as an underwriter to that issue which increase public confidence.

In book building process, the price of IPO will be assessed through gaging interest of the relevant parties in the IPO shares investment. For that purpose information will be gathered through a bidding process where high individual investors and Institutions are participated. Then a record is maintained in the book regarding the demand of IPO share at different levels from differ parties. Then floor price will be fixed with the mutual agreement of IPO firm and book runner. The strike price will be fixed after the closure of bidding process.

### **1.3 Intra-Industry impacts of IPO**

Intra-industry impact of IPO basically measures how IPO event impact the performance of already existing firms in the industry where IPO event occurred. When an IPO event take place and firm go public for the first time, it has certain consequences for both IPO firm and

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<sup>5</sup> Securities and Exchange Commission of Pakistan (SECP)

the firms which already exist in the same industry where this event take place. Akhigibe et al (2003) found insignificant impact of IPO on its industry counterpart, whereas Hsu et al (2010), chemmanur and He (2011), Chod and Lyandres (2011), Spiegel and Tookes (2016), Packer and Spiegel (2020) and Billet Ma and YU (2021) found negative impact of IPO. Whereas Li, Zhang (2021) found a positive impact of IPO on its rival firms.

In Pakistan this is the first study to find the impact of IPO event on its industry counterparts. Although numerous researches has been conducted on IPO but there were mostly taken IPO as a firm specific event. They mostly measure the performance of IPO firm after the IPO event (Sohali and Nasr, 2007; Sohail and Raheman, 2009; Javid and Malik, 2016; Mumtaz, 2016; Mumtaz and Ahmed, 2016; Mehmood et al, 2020; Anwar and Rasid 202; Mehmmod et al., 2023). The present study is different in two ways, first it measures the performance of rivals firms which is not tested in Pakistan. Secondly, it measures the pre and post IPO event performance of rival firms which was not possible for IPO as firm specific event due to unavailability of IPO firm data before IPO event.

#### **1.4 Inter-Industry impacts of IPO**

In inter-industry analysis, the study provides a comparison among different industries and tries to find out the impact of IPO that varies among industries. Since every industry has its unique features which may vary from other industries like; size of industry, competition among firms, government regulation, demand for the product or service offered by the industry etc. Due to such elements the performance of industries may vary after the IPO event.

Previously industry wise IPO analysis was conducted by (Sohail, 2016) where they made a comparison among five sectors namely; Private sector, State Owned Enterprises (SOEs), Manufacturing firms, Financial firms and Services sector. His findings revealed none of the

sector is efficient in terms of constant return to scale (CRS) and variable return to scale (VRS), however SOEs perform better than private IPO firms.

### **1.5 Economic consequences of IPO event**

Developed economies like USA conducted average 435 IPOs, whereas China conducted average 510 IPOs per year in last five years<sup>6</sup>. This shows a great demand for IPOs in relation to growing economic needs for the developed economies. Therefore the present study wants to see the relationship between growing economic needs and number of IPOs in the country. The study has taken External factors which include both economic as well as stock market variables. Macro economic variables like GDP growth rate (GDP), Foreign Direct Investment (FDI), Industrial Production (IP), Interest Rate (IR) are included among key elements to measure the economic strength of any country. In addition, more IPOs are a sign of expansions in the already existing industrial set ups and fulfilling funding requirements of the new entrants. These funds may be funneled through financial markets. Therefore the study also takes stock market variables like market index and trading volume to see their impact on IPO numbers.

Similarly, stock market indexes, market trading volume are the performance indicators of a stock market. Therefore the study is interested to see the impact of such factors on number of IPOs.

### **1.6 Problem statement**

There is a continuous decline in registering new IPOs in Pakistan from the last two decades. This downturn is more worsen after the Economic Recession of 2007-08. This multifaceted problem raises many questions about growth of firms, industry and overall economic progress in Pakistan. To answer these questions, it is important to understand the internal and external

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<sup>6</sup> Statista

factors associated with Initial Public Offerings. Since internal issues which are limited to IPO firms have already been explored, therefore the study is focusing on external factors which are associated with IPOs. This downturn in IPO process is also supported by the sluggish economic growth in Pakistan during the same time period. However, this is not matched with the performance of Pakistan Stock Exchange (PSX), which exhibited a remarkable performance during the same time span. Pakistan Stock Exchange (PSX) was considered among world top ten best performing markets for year 2012, 2013, 2014 and Asian best in year 2016<sup>7</sup>. This mismatched among the progress of IPOs, Economy and Stock market further motivates to check whether IPO phenomena is more associated with growing economic needs of the country or closer to the market dynamics (Stock Exchange) where it take place.

### **1.7 Research question (s)**

To address above stated issues, the study raise the following questions;

1. How the industry rival firm's aftermarket performance affected through an IPO event (Intra-industry impact of IPO)?
2. Does IPO firm outperform its competing firms in short and long-run?
3. Which industries are more affected through IPO event as compared to other industries (Inter-industry impacts of IPO)?
4. Does any causality exist between external factors (both market and economy) and IPO?

### **1.8 Research objective (s)**

In addressing the above mentioned issues the study has following objectives:

1. To find how an IPO event affect the aftermarket performance of rival firms operating in the same industry (Intra-industry impact of IPO)?
2. To make a performance comparison between IPO firm and rest of the industry.

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<sup>7</sup> Bloomberg 2016

3. To find which type of industries are more affected through IPO event (Inter-industry impacts of IPO)?
4. To find long term association between an IPO event and external factors (both market and economy).

### **1.9 Significance of the study**

There are multiple benefits offered by an IPO; to investors, to IPO firms and to the economy as a whole. It is now a well-established fact that IPO provides high initial returns to investors due to underpricing (Ljungqvist, 1999; Almeida and Dugue, 2000; Loughran and Ritter 2003). Beside investor's benefit it is also beneficial for fast growing firms like Martin (2001) examined young, innovative and fast growing German companies and revealed that IPO opens new perspectives by improving their capital base. Similarly Hsu (2014) documented a strong relationship between industry technology innovation and IPO volume. In addition, IPO bring improvement in job market as reported by Kenny, Patton & Ritter (2012) who analyzed US firms and found 161% Post-IPO increase in the employment in IPO firms. Therefore it is important to examine the impact of IPO on firms, industry and at macroeconomic level in a developing country setting. This will help to understand whether IPO is associated with growing economic needs of a country after attaining a certain level of development or it is useful for underdeveloped or developing economies as well. Furthermore, IPO is an event which is conducted on stock market which serves as primary and secondary for IPO but at the same time it has economic consequences as well. Therefore it will be important to understand the association of IPO with market and economy and to conclude whether IPO is more relevant to growing economic needs or the stock market where it conducts.

### **1.10 Scope of the Study**

The present study examined IPO phenomena externally to the extent of its industry peer firms and overall industry. The study also finds the associated between IPO and external Factors which include both macro-economic and stock market factors. This analysis is conducted in developing economy settings of Pakistan.

### **1.11 Organization of the study**

The study includes six chapters in all. First chapter of the study comprises of introduction of IPOs along with associated issues and significance. Second chapter reviews the previous literature, along with theoretical reflections and gap analysis. Third chapter includes theoretical framework and hypothesis development. Fourth chapter will discuss the population and sample selection, data collection and analysis techniques. Fifth chapter have been utilized for discussion on outcomes of the research. The last chapter of research will conclude the study along with their limitations, significance and future ideas.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Theoretical Background**

IPO as an isolated event have been explained through different theories. Rock (1986) presented a 'winner's curse theory'. According to this theory those who invested in IPO firms share later faces the curse of overpaying for these shares. The causes for winner curse are information asymmetry between investors and firms management, unnecessary high market sentiments created through road shows by underwriters and deliberately offer IPO shares at less price called Underpricing. Another theory in support of IPO was presented by (Allen & Faulhaber, 1989) called “Signaling theory”, which states that IPO firm management applied various signaling methods to better gone through IPO event. In order to create positive signals about IPO firms, the management conducts IPO through highly reputed underwriters, capture public trust through auditing and disclosure of accounting information. Such activities before IPO event create investor’s overreaction towards IPO firm and they undermine the other existing firms operating in the same industry.

Laughran and Ritter (1995) introduce the “windows of opportunity” theory, to explain over-optimism among investors which creates opportunity for the owners of firms to achieve a higher price for the shares. Again such over optimism towards IPO firm create negative signals for its rival firms which results in decline in their share prices after the IPO event.

Both theories provide a link between IPO event and rival after market performance but they mostly focused on IPO firms valuation. Since the aim of the present study is to focus on intra-industry impacts of IPO, therefore the study tries to focus on such theories which can explain

how IPO event impact its rival firms which are already operating in the industry where IPO occurs. For that purpose the following two hypothesis will be discussed in detail.

### **2.1.1 Information effect**

#### **2.1.1.1 Information effect for IPO firm**

IPO information effect has been explained by the most renowned pecking order theory. This is based on the idea that information asymmetry exists between management and investors. Managers have better information about the company's prospects and true value compared to external investors. As a result, companies may avoid external financing (equity) as much as possible to minimize the chances of undervaluation and adverse selection problems. In short, the pecking order theory suggests that companies prefer internal financing first, followed by debt financing, and resort to equity financing as a last resort due to information asymmetry and associated costs. Many researchers explained signaling theory in the light of Pecking Order Theory in finance research. Researchers justified firm's quality through information effect, like Ross (1977) argued that firms maintain debt in their capital structure in order to portray firm quality. Similarly, Bhattacharya (1979) has added that corporations issuing dividends as an attempt to portray signal quality. Both models justified the signaling phenomenon in a sense that only strong firms can afford to pay off the debt and paying dividends continuously. It is also noted that the announcements about bankruptcy of a firm have strong information effect on rival firms (Lang and Stulz, 1992; Cheng and McDonald 1996; Ferris, Jayaraman and Makhija, 1997). Similarly Madura et al. (1999) while analyzing acquisition announcements in an industry reported a significant information effect.

In addition many researchers used signaling theory to explain pre and post IPO firm's performance. These studies anticipated that potential IPO investor is uncertain about IPO



firm's performance. This problem is overcome by firm's management by sending positive signals to indicate firm quality (Beatty, 1989; Carter & Manaster, 1990).

Researchers also exhibited that investment banker's reputations also signaling firm quality to investors (Carter et al., 1998). In the similar fashion Titman and Trueman (1986); Beatty (1989) used auditors quality, whereas (Megginson & Weiss, 1991) taken venture capitalists reputation as signals in the IPO process. Similarly Certo (2003) explained how board structures effect the investor's decision making while purchasing shares of IPO firms. IPO firm most of the time suffer from a dilemma of market newness and relatively unfamiliar to investors. This problem can be overcome through signaling theory, as a prestige board composition signals organizational legitimacy, hence overcomes the issue of market newness and increasing IPO firm stock performance. More recently McGuinness (2014) also documented potential signaling effect on IPO valuation. He found a strong link between recent regulatory requirements about prospectus disclosures items (i.e. existence, size, lock-up period and number of investors) and IPO startup value.

#### **2.1.1.1 Information effect for Rival firms**

Many researchers explained information or signaling effect while explain IPO intra industry effects. In a study, Ritter (1991) argued that a firm decides to go public when it observes investors are over optimistic about their industry. Such feeling of investor is positively associated with increase in other firms' stock prices at the occasion of IPO. Unlike Ritter (1991), Akhigbe, Borde and Whyte (2003) found an insignificant impact of IPO on its rival firms'. He argued that signaling effect is countermand by competitive effect, therefore no impact on rival's portfolios share prices drawn by IPO in short run.

Conversely, many researchers proved the negative signals associated with IPO for its industry rivals (Slovin, Sushka and Ferraro, 1995; Akhigbe, Borde and Whyte, 2006). They explained

managerial signaling models by incorporating adverse selection problem as previously explained by (Leland and Pyle, 1977; Titman and Truman, 1986). This model says managers of IPO firms' are better informed than outside investors. This information inferiority exerts a negative signal on rival firms, which ultimately results in reduction in their share prices. . More recently, Cotei and Farhat (2013) have found significant information effect due to existence of IPO.

Park and Patel (2015) analyzed the relationship between underpricing of IPO firms due to ambiguous information given through prospectus. For that purpose study has taken a sample of 398 IPO firms covering the time span of 10 years from 1998 to 2007. In line with previous research it proves the signaling effect of IPO i.e. firms do less underpricing if information given are less ambiguous and disclose firm's quality to investors. However, this relationship also requires a high level of strategic conformity with industry rivals otherwise it does not work. This relationship also disturbed when IPO firm belong to high value heterogeneous industries or having a medium size. Overall the study prove the existence of signaling effect surrounded an IPO event.

Wales and Mousa (2016) documented how firm's behavior and reflections in their prospectus impact post IPO outcomes and analyzing signaling effect in a different way. They take a sample of new high technology IPO firms. They have noted that firm using less emotional claim and more rational approach have been better off with their IPO underpricing outcomes. The information gathered from their prospectus and noted such claims. It has also been noted that high level of commercial claims which beyond rationality further exacerbate pessimistic on underpricing.

Recently Signori (2016) analyzed signaling theory with respect to IPO market with specifically focused on signaling effects of innovation in IPO firms. While considering 382 European firms from high tech industry covering a time span of five years from 1998 to 2003,

how innovation impacts liquidity of IPO stocks. According to his research innovation transmit entirely different signals to investors unlike the normally done by IPO firms. Further it has two different dimensions; one is from innovative input side in case of research and development, which can be quantified. The second one is from patent which is considered to be output side. The study further reveals that firms enjoy high liquidity if it invests more in research and development side. On the other hand size of patents does not create any significant impact. Therefore the study advised potential investors to give more weightage to such firms which focus on research and development and less priority to firms having patents.

Similarly Reber and Vencappa (2016) explored the factors which effect IPO firm's premarket underpricing decisions and aftermarket mispricing. Discussing about signaling mechanism they have found willful underpricing of a firm as function of asymmetric information around IPO contrary to equity retention which seemly unlikely to convey signals to investors. Applying Stochastic Frontier Analysis they have discovered lock-in agreements, underwriter costs, usage of proceeds from IPO, demand for firms capital and venture capital have positive influences on willful premarket underpricing. On the other hand market conditions are found to be in significant in determining underpricing. While comparing willful premarket underpricing with post market mispricing, the former out class the later in terms of IPO stock initial returns. They feature post market mispricing to trading volume in IPO shares on the 1st day, price correction amongst the filing price, offer price and offer size. Unlikely equity retention describes the aftermarket mispricing instead of willful premarket underpricing which is against the signaling theory. More upright underwriters are expected to deliver price backing in the initial aftermarket, however nothing to do with premarket underpricing.

Guldiken, Tupper, Nair, Yu (2017) applying signaling theory to analyze the impact of media on stock returns of IPO. While conducting an in depth analysis they are trying to focus on two main dimensions; the first one is the role of credible media and the second one is the tone of

media regarding IPO. Then they see how these dimensions impact IPO firm stock performance? They have found a positive and significant impact of creditable media on stock returns of IPO. In addition, they have noticed a negative impact of ambiguous information portray through media on stock price of IPO firms.

The researchers found both significant and insignificant intra industry effects of IPO while applying signaling theory. In addition, the significant impact has also in both ways i.e. positive or negative. These contradictory findings bring motivation to conduct the present research to analyze which way signaling theory creates intra industry effect?

### **2.1.2 Supply effect**

IPO intra-industry impact can be explained through supply effect. Initially research denied any impact of asset supply on prices of assets. Scholes (1972) disagreed with the supply effect of asset on asset prices in the world of flat asset's demand and argued that market price of existing firm does not affect due to IPO. His argument based on assumption that the firms with fewer additional claims to finance investment, leads to small percentage of assets supply, result in insignificant change. Moreover, standard asset pricing models overweight investor's behavior as compare to supply effect while explaining behavior of securities prices. Therefore in past decades researchers considered either supply as unchanged component or perfectly elastic (Lucas, 1978; Cox, Ingersoll, and Ross, 1985). However, Shleifer (1986) opposed flat asset demand and argued even for small percentage changes supply effect could exist due to lack of alternative and limits to arbitrage.

Furthermore, recent research removed these intense hypotheses to realize impact on assets price due to relative supply of risk. Baker and Wurgler (2000) reported that the market price of shares is likely to decline after phase of new listings. Likewise, Ofek and Richardson (2000) demonstrate that a rise in supply of shares through over optimistic behavior like in case

of internet stocks eventually results in huge decline in their prices afterwards. Newman and Rierson (2004) during an event study reported a decline in European telecommunications firms' bond prices due to a large issuance of bonds in Deutsche Telekom. Similarly Cochrane, Longstaff, and Santa-Clara (2008) found the impact of supply on changes in asset pricing. In addition, Hong, Kubik, and Stein (2008) documented that market-to-book ratios and relative asset supply are negatively correlated in US market.

A supply effect is also noted in the fixed-income market. More directly Braun and Larrain (2008) analyzed the supply effect while focusing on the impact of IPOs on the prices of other firms shares. They documented that big IPOs constantly affect other stock prices in the market. Moreover, a decline in prices of portfolios with newly added asset has been observed as compare to other portfolio in the month of the issuance.

Over all the supply theory explain IPO in the following ways. Firstly IPO increases the quantity of shares in the market, which results in a decline in the prices of relevant firms' shares. Secondly, it brings positive impact in its relevant industry and overall market if it perform well at the start. It also cause reduction in demand of already existing firm's shares in a way that investors can readjusts their portfolios and bring IPO shares in place of rival firms shares.

Keeping in view the consequences discussed above, the present study explained supply effect in two ways; first to see the after event performance of rival firms i.e. operating performance and stock returns. Secondly how much this supply effect brings changes in liquidity, leverage, volatility and market shares of rival's firms?

### **2.1.2.1 Supply effect and Economy**

The second part of the study focused on external factors (both market and economic) on happening or non-happening of IPOs. This phenomenon is also explained through supply

effect. Friedman and Schwartz (1963) argued that growing economy required more financial centers and concluded that more financial development is caused due to real economic growth of the country. One argument for the co-movement of stock market and economic growth has been supported by supply leading theory presented by (Mckinnon, 1973; Shaw, 1973). They argued that financial assets accumulation leads to economic growth of any country. Since financial markets is an efficient way of funneling these assets towards economy, therefore stock market development results in economic development. Contrary to above findings Lucas (1988) documented there is no relationship between financial sector and economic growth in friction less economic settings where zero transaction costs and perfect information. This idea is opposed by many researchers on the grounds that there is no economy without having transaction cost and perfect information (Graff, 2000; Fink, et al., 2006).

To answer the question of co-movement between financial development and real economic growth, Pagano (1993) and Bekaert et al. (1995), pointed out three main channels which linked the both sectors. First, financial development encourage savings which are channeled towards investment sector, Secondly, development of financial sector could affect the saving patterns which results in changing saving rates and investment levels and thirdly, capital allocation efficacy is also effected through financial development. Moreover, among three channels, the second and the last are more efficiently explain the link between financial sectors and real economy (Beakaert and Harvey, 1997). The above cited work helps to understand the requirements of more funds for fulfilling growing economic needs but having mixed results in linking stock market development with economic development.

In addition, there are Economists who supports the idea that macroeconomic conditions have a capacity to bring changes in the industry and firm level performance (Issah & Antwi, 2021; Iqbal, gan & Nadeem 2019; Gupta & Krishnamurti 2018). The changes in discount rate at macroeconomic level would affect firm's cash flow patterns that would result in firm decision

to go public. In case of upward economic trends, the individual firms demand more funds to keep the pace which can be fulfilled through equity offerings. In case of downturn in economic and political climate, the investor's sentiment is negatively affected and that would result in hesitation of firms to go for equity offerings and find other ways for financing which decrease the overall IPO activity. Therefore the hypothesis can be drawn on the existence of co-movement between growing economic needs and growing funding needs of firms which can also be fulfilled through equity offerings. Since stock market is a mean to channelize these funds to corporate sector, therefore it is also important to see the association between stock market and initial equity offerings.

The summary of relevant theories in tabulated form is as under:

**Table 2.1 : Tabulated Evidences of the Relevant Theories**

<b>Theory</b>	<b>Author</b>	<b>Supported/ Against</b>	<b>Significant Insignificant Positive Negative</b>	<b>Theoretical Findings</b>
Information effect	Ross (1977)	Supported	Significant Positive	Ross (1977) argued that firms maintain debt in their capital structure in order to portray firm quality.
Information effect	Bhattacharya (1979)	Supported	Significant Positive	Corporations issuing dividends as an attempt to portray signal quality. So justified the signaling phenomenon in a sense that only strong firms can afford to pay off the debt and paying dividends continuously.

Information effect	Ritter (1991)	Supported	Significant Positive	Firm decides to go public when it observes investors are over optimistic about their industry. Such feeling of investor is positively associated with increase in other firms' stock prices at the occasion of IPO.
Information effect	(Lang and Stulz, 1992; Cheng and McDonald 1996; Ferris, Jayaraman and Makhija, 1997)	Supported	Significant Positive	Announcements about bankruptcy of a firm have strong information effect on rival firms.
Information effect	Akhigbe, Borde & Whyte (2003)	Against	Insignificant	Found an insignificant impact of IPO on it rival firms'. He argued that signaling effect is countermand by competitive effect, therefore no impact on rival's portfolios share prices drawn by IPO in short run.
Information effect	(Slovin, Sushka and Ferraro, 1995; Akhigbe, Borde and Whyte, 2006).	Supported	Significant Negative	Argued that the negative signals associated with IPO for its industry rivals
Information effect	Cotei and Farhat (2013)	Supported	Significant Negative	Have found significant information effect due to existence of IPO.
Information effect	McGuinness (2014)	Supported	Significant Positive	Documented potential signaling effect on IPO valuation. He found a strong link between recent regulatory requirements about prospectus disclosures items and IPO startup value.



Information effect	Wales and Mousa (2016)	Supported	Significant Positive	Firm's behavior and reflections in their prospectus impact post IPO outcomes, thus analyzing signaling effect in a different way.
Information effect	Recently Signori (2016)	Supported	Significant Positive	Analyzed signaling theory with respect to IPO market with specifically focused on signaling effects of innovation in IPO firms.
Information effect	Reber and Vencappa (2016)	Supported	Significant Positive	Explaining signaling mechanism they have found willful underpricing of a firm as function of asymmetric information around IPO contrary to equity retention which seems unlikely to convey signals to investors.
Information effect	Guldiken, Tupper, Nair, Yu (2017)	Supported	Significant Positive & Negative	Analyze the impact of media on stock returns of IPO. They have found a positive and significant impact of creditable media on stock returns of IPO. In addition, they have noticed a negative impact of ambiguous information portray through media on stock price of IPO firms.
Supply effect	Scholes (1972) (Lucas, 1978; Cox, Ingersoll, and Ross, 1985).	Against	Insignificant	Disagreed with the supply effect of asset on asset prices in the world of flat asset's demand. Market price of existing firm does not affect due to IPO. Firms with fewer additional claims to finance investment, leads to small percentage of assets supply, result in insignificant change.

Supply effect	Shleifer (1986)	Supported	Significant Negative	Opposed flat asset demand and argued even for small percentage changes supply effect could exist due to lack of alternative and limits to arbitrage.
Supply effect	Richardson (2000)	Supported	Significant Negative	A rise in supply of shares through over optimistic behavior like in case of internet stocks eventually results in huge decline in their prices afterwards.
Supply effect	Newman and Rierison (2004)	Supported	Significant Negative	Reported a decline in European telecommunication firms' bond prices due to a large issuance of bonds in Deutsche Telekom.
Supply effect	Cochrane, Longstaff & Clara (2008)	Supported	Significant positive	Found the impact of supply on changes in asset pricing.
Supply effect	Hong, Kubik & Stein (2008)	Supported	Significant Negative	Argued that market-to-book ratios and relative asset supply are negatively correlated in US market
Supply effect	Braun & Larrain (2008)	Supported	Significant Negative	Discussed supply effect while focusing on the impact of IPOs on the prices of other firms shares. They documented that big IPOs constantly affect negatively other stock prices in the market.
Supply effect	(Issah & Antwi, 2021; Iqbal, gan & Nadeem 2019; Gupta & Krishnamurti 2018).	Supported	Significant Positive	Supports the idea that macroeconomic conditions have a capacity to bring changes in the industry and firm level performance

## **2.2. Literature on Initial Public Offerings**

IPO has been discussed a lot in previous research but most of the previous work focusing IPO as an isolated event where they found the implications of IPO event on IPO firm itself. In this section, we will intra-industry impact of IPO on rival firms and in the second part we will see the number of IPOs affected through external factors.

### **2.2.1. Intra-industry impact of IPO on rival's performance**

Intra-Industry valuation effects of IPO in terms of carve outs, spinoff and sell off, the work initiated by (Slovin, Sushka & Ferraroc 1995). Taking the data of equity carve outs of US firms from 1980 to 1991 and applied two days event window, they found different results in all three measures. Their findings revealed a significant negative share price reaction has been of rivals if firm gone for carved out. However, in case of spin off strategy adopted by a firm than its rivals experienced positive returns. Moreover, the rivals in case of sell off units the study found no considerable change in returns.

Akhigbe, Johnston and Madura (2006) analyzed the impact of IPO event on its industry rivals stock returns in long-run in NYSE. To analyze data they used the event study method of Buy and Hold Abnormal Returns (BAHR) Overall they have found an unfavorable share price movement of rival firms on average over the 3 years period after the occurrence of an IPO.

Purnanandam and Swaminathan (2004) have gauged intra industry impacts of IPOs using rival firms multiples in US market by applying peer matching and cross sectional regression. While making a comparison between IPO and its rival firms they found an IPO firm is overvalued more than 50 % as compared to its industry rivals. Moreover, they reported that IPO firms outperform their industry peers in short run up to 5% to 7% but in long run up to 5 years' time, their performance is under perform in terms of rivals up to 20% to 50%.

Braun and Larrain (2009) checked the intra-industry IPO effect with respect to supply theory by taking US firms data from 1973 to 2004. By applying market adjusted returns followed by regression, they found, the launch of a large asset in the market causes fluctuation in the prices of existing assets. It has been noted that portfolios with high IPO undergo a reduction in prices as compared to other portfolios during the time of issue. Moreover, in less integrated international markets, the impact is stronger with bigger IPO.

Qian and Raun (2010) conduct a study which discovers how competitive effect of rival firm impacts the pricing and operating performance of IPO firm in terms of signaling theory in Chinese market. They applied difference in difference (DiD) analysis in five quarter window to analyze the phenomena. They have specifically focus how rival firms earning news impact IPO firm on time period between IPO announcement and listing date. They have found a significant negative impact of rival earnings on IPO firms during that time. Moreover these news positively correlated with withdrawal probability of IPO firms.

Cotei and Farhat (2011) have compared a venture capitalist (VC) backed IPO with a without VC backed IPOs in USA from 1983 to 2001. By applying Fama-French three factor model, they found a positive reaction from already listed firm's portfolios if an IPO is backed by VC and vice versa. They argued that VC backed IPOs pass on a signal of better information from industry viewpoint which lead towards a positive valuation reaction by competitors and vice versa.

Lee et al. (2011) analyzed the impact of IPO event on technology firm's specifically related to computers in US from 2000 to 2004. By applying cross-sectional OLS regression and CAR with three-day window, their findings revealed the positive information spread out in more efficient way on already listed firms in the similar product market as compared to already

listed firms in associated product markets. Moreover, R&D expenses impact valuation positively while industry concentration impact valuation negatively.

McGilvery, Faff and Pathan (2012) analyzed Australian IPOs intra industry impacts specifically to what extent it explained through IPO firm's corporate governance mechanism and objective behind proceeds received through IPO. By applying 3 days and 10 days CAR window followed by multivariate regression, they found rival firms negative performance associated with IPO firms corporate governance elements of board size and CEO shareholding. Moreover it is further deteriorate rival firms performance if IPO firm disclose its objectives of proceeds receive from IPO.

Levesque, Joglekar and Davies (2012) compare US IPO firms and their rivals firms in terms of allocation funds and cost of goods sold expenses. By applying regression analysis, the result specified a production function which is responsible for creating association amongst resource allocation with research and development and cost of goods sold to firm revenue. It further shows that IPOs firms resource allocation pattern is significantly differ from well-established existing firms.

Nguyen and Sutton (2014) found US IPOs as bad news to existing firms in the same industry that's make investors overly optimistic about IPO prospects, especially during hot IPO markets. By applying Tobit and Probit model followed by regression, they have found the negative industry rival reaction which could be the result of investors' over-optimism about the IPOs' prospects and underestimation of the competitive positions of industry rivals. They further reported that rival firms use repurchases to correct for the market's overreaction to the IPO threat. These IPO-induced repurchases are stronger when the rival firms are in a concentrated industry and experienced poor stock performance in the previous year.

According to the study conducted by Spiegel and Tookes (2014) who applied structural model in US settings and reported if the newly public firm became resilient through the IPO, then the IPO assist the IPO firm and competitors are adversely affected. Their findings suggested that IPOs is an indication of future changes in industry but they are not the reason for these deviations.

Datta , Gruskin and Datta (2015) conduct a study in US market which observe the post-IPO share value by distinguishing amongst IPOs and three categories of Reverse Leverage Buy Outs (RLBOs), the first one is public into private , division into private, and private into private transactions. By applying Fama French (1997) industry grouping model, they found for all three categories, IPO firms out class rival firms. The study also documented that private period restructuring are more beneficial if firms having underwriters of great repute.

Chen, Francis and Wu (2016) conduct another study in US by taking data from 1995 to 2019 and found a unique impact of IPO firms on its rival while considering tax avoidance behavior of rivals firms. By applying base line regression, they found rival firm tax avoidance by reducing their effective tax rates and cash effective tax rates to avoid the negative outcome of big IPO.

Spiegel and Tookes (2016) came with US data from 1983 to 2012 and found the causes of deterioration in rival firm performance after IPO event. By applying regression analysis, they found the reason for such deterioration is due to competitive advantage attained by newly listed firm over the exiting firms. Furthermore, the reduction in performance is due to increase commoditization by newly listed firm.

The study by Baxamusa and Jalal (2017) offers a new justification that is customer-supplier relations for more occurrences of IPOs. By taking US data and applying stepwise panel

regression, they documented that the causes for increase in number of IPOs in a particular industry is due to demand shocks which is further strength by customer supplier relationship.

Recently Li , Suna and Tian (2018) studied Chinese IPO market and observed if intra industry impact of IPO exist or not. By conducting regression analysis of industry CARs, they have found IPO creates a significant negative impact on its rival firms share prices. This IPO announcement disturbed negatively the equilibrium in rival's stock prices and those competitors are more affected whose share prices are more correlated with IPO firms stock. The study negate signaling effect of IPO announcement which bring downturn on rivals share prices and suggest that it is due to expectation based downward demand curve sloping.

Rogova & Chelombitko (2018) argued either the competitive environment is limited to specific firm or industry as whole is being influenced by an IPO. They grouped the IPOs impact into two broader categories, first is information and other is competitive. Applying event study methodology of CARs, their finding revealed that competitive effects dominate over information effect. Moreover, negative competitive on rival is more powerful if IPO is big and the industry is more concentrated.

Spiegel and Tookes (2019) taking US data from 1983 to 2012 and applying pane regression analysis they documented that decline in rival performance after IPO event is mostly due to changes in industry trend and this is also the reason for the occurrence of new IPOs. In addition to that, they have reported that IPO firm performs better as compared to its competitors at the expense of their competitors. This study resolves the earlier claims of other researchers who documented an average performance decline of IPO firms and their competitors.

Gao, Rezaee and Yu (2020) takig US data from 1976 to 2012 and investigated either IPO pricing is affected by the financial characteristics of peer firms and whether market

competition fluctuates as a result of spread of information by the IPO firm. By applying various panel regressions, they came up with three main findings. Firstly, it demonstrates that IPO firms are not taken in isolation from peer firms by the potential investors and peer firms' earnings features greatly influence the IPO underpricing. Secondly, it shows that earnings predictability is not always taken as desired attribute by the market, and it has practical consequences for firms and their regulators. Lastly, it is concluded that IPO underpricing is affected by market competition from both peer firms and managerial ability.

The study by Packer and Spiegel (2020) analyzing the firm level IPO impact while focusing on listing suspensions in China under the panel specifications by keeping in view macroeconomic and financial conditions. By applying panel regression model, the study recommends listed firms can be negatively affected by initial public offerings (IPOs) as a result of increase in competition within industry directly, and through covering market spaces of related assets.

Aghamolla and Thakor (2020) investigated the impact of US IPO firm to go public on its industry counterpart in drug industry. By applying regression analysis, their findings reveal that there is more probability for a firm from drug industry to go public when it experiences any recent IPO from their counterpart. In addition, it is completely different from hot market effects and other traditional shocks. Moreover, this sort of effect will only be applicable on firms that operate in less concentrated industries. Furthermore, the funding tendency for a private firm is broadly affected due to rival competitive effects.

Zaluki and Badru (2020) examined three intended usage of Malaysian IPOs funds namely growth opportunities, debt repayment and working capital of IPOs funds and see how they impact rival firms performance. The outcomes reflect that the anticipated utilization of IPO funds for growth opportunities and working capital is positively related with IPO initial returns; however debt repayment is adversely associated with IPO initial returns.



Another study conducted by Billett Ma and Yu (2021) in US by taking data from 1991 to 2017, they documented industry competitors are adversely affected by the adverse consequences of a firm's initial public offering (IPO) therefore they adopt different strategies to mitigate that effect. BY applying regression analysis, they found rival firms presenting their downward income level, issuance of negative management forecast, and issuing more poor disclosure specially in the event where counterpart participate in IPO. Earnings are more tightly controlled by the rival firms in case where costs are low and benefits are more. Such type of tactical disclosure decrease rival firms estimation and related with more adverse media sentiments for IPO firm. Consequently, it compel IPO firms to generate less capital, attain less offer prices and there is chance that they are forced to withdraw from IPO activity. In addition, the IPO firm observe less profitability, less investment opportunities, and having more idle cash after the IPO as compared to their competing firm which enjoying more profitability and market share.

The above mentioned work on IPO intra-industry effect on peer firms shows negative consequences of IPO so far, however, there are few studies which documented a positive valuation impact of IPO on its industry counter parts.

Chintya, Theodora, Evelyn and Teja (2020) conduct a study on IPO intra-Industry impacts in Indonesian market. They have documented a negative impact of IPO event on its industry peers in short run. However, they have found a positive impact of IPO event on both IPO firms and its rival firms. Moreover the positive impacts are stagnant in long run for IPO firm which helps peer firms to attain the same level after some time.

Similarly, Li and Zhang (2021) examine how the rival firm reactions on stock price impact the IPOs in China. By applying panel regression, they documented a positive valuation effects on IPOs in China over the period from 2002 to 2012, contrasting the results in the U.S. The outcome of this study is more vigorous as compared to other opponent theories. This study

proposes three non-competing hypothesis including the signaling hypothesis, the collusion hypothesis, and the substitution hypothesis based on the prevailing models and established setup in China. The study concluded that substitution hypothesis better explain IPO intra-industry positive impact on rival firms. Moreover, it is also discovered that escalation in investment opportunities after 2014 results in reduction of IPOs.

In addition, there are few studies which found no impact of IPO event on its rival firms. Akhigbe, Borde and Whyte (2003) analyze the intra- industry impact of an IPO on its rival firm's portfolios stock returns in short run. Taking the data of US firms from 1990 to 2000, their finding revealed that impact of IPO is not significant on already listed firms within the same industry. They explained that irrelevance between two variables is due to competitive and information effect which counterbalances each other resulted in insignificant intra industry impact of IPO. In another study

Similarly, Henry (2022) analyzed IPO intra-Industry impact on US firms and found no impact of IPO event on their sales growth, Returns on sales and Tobin Q in long run up to 3 years. However, rival firms performance will be decline in term of above three measures if they are facing less liquidity and high leverage before the event.

By concluding the literature on IPO, it has been divided in to two parts. In first part, IPO has been taken as firm's specific event and see the implications of IPO event on IPO firm. For that purpose, IPO has been discussed through different aspects like underpricing, initial and long run stock returns, ownership structure, issuance methods, underwriter's reputation and earnings management etc. Researchers analyzed the implications of such elements on firm's IPO decision (Coakely, Hadass and Wood, 2007; Lowry, Officer and Schwert, 2010; Vismara, Signori and Paleari, 2015). Similarly, in Pakistan the literature on IPO is limited and again it has been discussed IPO as firm specific event and focused on internal implications of IPO (Rizwan and Khan, 2007; Sohail and Nasr, 2007; Sohail and Raheman, 2007, 2010; Mumtaz

Smith and Maqsood, 2016). This is no doubt helps the management within the organization to understand whether to conduct an IPO or not but it ignores the outcomes of IPO event on external environment like its peer firms and industry.

When considering IPO intra-industry impacts, the study found a very limited literature on this topic. Only few studies have been done in the last two decades which shade some light on this phenomenon. IPO intra industry effect has been noted down in few research earlier (Ritter, 1991, Akhigbe et al. 2003, 2006; Hsu et al., 2010; Peller, 2013). However their findings are not in line and presented contradictory results of IPO on its industry rivals. Like Ritter (1991) explained IPO as a positive signal for its industry rival. Similarly Eckbo and Norli (2005) reported IPO stock under perform as compared to their same size matched firms from 3 to 5 years' time. Whereas, Akhigbe et al., (2006), Hsu et al., (2010), Chod and Lyandres (2011) and Chemmanur and He (2011), Mcgilvery et al., (2012), Peller (2013) and Spiegel and Tookes (2016) have found negative impact of IPOs on competing firms performance. The work of Hsu et al., (2010) with the name "The New Game in Town" where the study reported significant negative impact of IPOs on its industrial rivals is challenged by the recent work of Li and Zhang (2021) with the name "Another Game in Town". Contrary to previous one, the research of the later study documented the positive effects of IPOs on its industry counterparts. The past and recent past literature on IPO intra-industry effects open the debate whether IPO effects are insignificant or significant? Even if impacts are significant then either they are positive or negative?

In addition, the research while considering IPO intra-industry impacts mainly emphasis on share price performance of rival firms or abnormal returns. In IPO intra-industry analysis, the other aspects like operating performance, liquidity position, share price volatility, leverage and industrial concentration (from monopoly to perfect competition) are mostly ignored. These external implications in respect of an IPO event are still unexplored. Moreover, the

short and long run leverage capacity of rival's firms has not been taken in to consideration while examine intra-industry impacts. Therefore, the present research also analyzes how IPO affects the liquidity and leverage position of its rival firms. These dimensions help us to understand the operational efficiency of IPO and its rival firms in more depth besides profitability comparison. In addition the present study also includes share price volatility of rival firms stock as compared to IPO firm to in-depth analysis of risk and returns. The study also analyzes the competitive effect in terms of industry composition and sees whether IPO effect is more or less stronger in competitive or less competitive industry environment? The study also included inter-industry impacts of IPO. As the name indicates it is different from Intra-industry which document the performance of rival firms operating in the same industry whereas the inter-industry performance shed light on comparison among industry in terms of IPO effects and see which type of industry is more affected through IPO?

Overall, when the literature on IPO intra-industry has been examined it came up with mixed findings. Draho (2004) found an IPO event is attractive for the industry if came up with competitive advantage for rival firms. Contrary to this, Hoberg et al. (2014) found that firms will not go to IPO until and unless they found competitive edge over rival firms. Furthermore, negative and positive price reaction on rival firms on completion and withdrawal of IPO has been documented by (Hsu et al., 2010; Chemmanur and He, 2011; Chod and Lyandres, 2011). However, it remains an open empirical question whether IPO event has any causality with rival firm's performance. In addition, even if the causality exists than it is important to decide on the direction that is positive or negative or both negative and positive segregated in short and long run.

## **2.2.2 Economic Environment and Initial Public Offerings**

There are researchers which shed light on the relationship between IPO and economic conditions. Numerous studies have documented the explanatory power of economic variables on IPO volume with respect to “market “timing”. There are studies which found the relationship between economic variables (stock index and general business activities) and listing of new firms. Loughran et al. (1994) reported that IPO volume is positively associated with the inflation-adjusted stock index.

Mauro (2003) found a correlation between output growths and lagged stock returns while comparing emerging and advanced economies. He found this relation is more pronounced in emerging economies as compared to developed countries.

Similarly Brailsford et al. (2004) documented the Pre-IPO conditions of stock market as a good indicator of future volume of the IPOs. Moreover, McKenzie (2007) discovered a significant relationship between stock market efficiency and business conditions with listing of firms’ in the developed economies. He also reported the past level of listing activity as most powerful variable which explained listing activity in future.

Chong and Pua (2009) analyzed the IPO’s volume, initial returns and economic development in Malaysia through time series analysis. Using ARDL bounds testing their findings revealed that IPO volume maintained a significant short-run and long-run relationship with both initial returns and economic conditions.

Tran and Jeon (2009) investigates how the initial public offerings’ activities are affected in the U.S. by the macroeconomic environment over the period from 1970-2005. They discovered long-run equilibrium links among activities of IPO and selected macroeconomic variables through the application of time series econometric toll. To determine the timing of initial public offerings, Stock market performance and volatility are proved to play the most significant part. To determine the amount of returns earned in the IPOs, the Fed funds rate and

the 10-year U.S. Treasury bond yield perform a vital role. To determine the long-run equilibrium path that is normally completed between the periods of 6 months to 1 year, they used various short-run dynamic adjustment tools among initial public offerings and macroeconomic elements.

Nasir, Hassan, Nasir and Harun (2013) see how GDP, CPI, lending rate and exchange rate in Malaysian economy impact performance of its stock market (KLCI). By applying Johansen co integration, Vector Error Correction Model (VECM) and Granger causality tests for observing long run relationship, they have found a significant positive relationship between stock market and economy. Results further reveal a unidirectional causality among variables like GDP, CPI, KLCI and BLR. Only exchange rates have a bi-directional causality with stock market. Moreover, they have found these variables are determinants of stock returns of Malaysian market.

Haul (2013) investigates the relationship among the initial public offering activity and financial market environment. The magnitude of offerings is determined by the variation in the rates of interest over the periods of preceding four quarters using vigorous regressions. With the low rate of interest, firms have tendency to earn more earnings in comparison to the rates of previous four quarters. In addition, lower interest rates make the IPO market more energetic as compared to the rates of previous four quarters. Moreover, capital structure of firms is not affected by the market timing.

Mauer, Wang, Wang and Zhang (2015) reported a significant relationship between IPO firms and growth of international business. They analyzed IPO event from several dimension like; the pricing of IPO, IPO aftermarket performance, and survival. By collecting a big sample of IPO firms in U.S from year 1981 to 2012, their findings reveal that firms' involve in exports before listing have significantly lesser underpriced than those without involving in

international business activity. Furthermore, public firms with international business activities perform better than local IPO firms' over the time span of 3 to 5 years period and considerably a higher survival rate.

Takahashi and Yamada (2015) conducted a research regarding how IPO impacts firms production, profits, size and job creation. They came up with very interesting results. The IPO firm's faces decline in their performance in terms of profitability and productivity but at the same time they experienced improvement in firm size i.e. sales as well as employment. Overall they concluded that firms which are going public enable high growth in terms of sales and employment at the cost of compromising their productivity and profits.

Gay and Jr (2016) conducted a study for BRICS countries to see whether any relationship exists between firms share prices and macroeconomic variables including exchange rate and oil prices. Unlike developed economies including United States they have not found any significant relationship in BRICS economies. The further discover no significant relationship between lag prices of stock returns in BRICS economies. This also proves a weak form efficiency of markets of such economies.

Kim and Kim (2017) investigated whether the exports of the country and its corporate governance have the impact on the initial earnings and performance in long-run of IPO firms in China. Therefore, the study considered two factors i.e. exports and government intrusion. The results indicated that initial return in the entire sample and both stock exchange samples separately have adversely affected by the exports. It is observed that underpricing is comparatively less critical for exporting firms just because of low level of asymmetric information in these firms as compared to non-exporting firms. In addition, initial returns of public sector firms are positively affected by the exports while it has adverse effect on the private firms' initial returns. Furthermore, IPO firms' performance in long run is adversely

affected by exports. The same results were already attained by earlier studies in china (Kim & Heshmati, 2010; Park Eun-Ji , 2012; and Tan and Kim, 2016)

Baxamusa and Jalal (2017) discovered the channel through which IPO waves propagate. They documented the relationship between customers and suppliers are the key reason for occurrence of IPO waves. In addition the demand shocks are responsible for large number of IPOs. These shocks then extend upward all the way through customer relationships, leading to a rise in the number of IPOs in more central and associated industries.

Chen, Wang , Tong and Zhu (2017) examined the role of economic freedom in determining the underpricing of IPO phenomena in various countries. It is concluded that the firms that enjoy high level of economic freedom face low level of underpricing issues. Underpricing is significantly and adversely linked with liberalization of the financial market and it is also in line with the prediction of ICAPM that liberalization of stock market may result in reduction of liberation of equity capital cost of a country. In addition, initial returns of IPO rate adversely linked with the dummy variables of the bear market whereas positively linked with dummy variable of the bull market. Further, they discover that bearish markets are more affected as compared to bullish markets by the market sentiment on underpricing of the IPO. The same results revealed by the previous studies like (Cornelli et al., 2006; Dorn, 2009). Precisely, they found a solid and vigorous proof that IPOs across different countries those have great economic liberty, particularly high degree of financial liberty; they face less underpricing issues of IPO.

According to the framework by Meluzin, Balcerzak, Pietrzak, Zinecker and Doubravsky (2018) designed a framework to see the connection between financial decision of firms and political instability. It also catalogued how activity of IPOs is affected if perplexed statements regarding the political instability are issued.



Ljungqvist, Persson and Tag (2018) have studied what are the reasons for shrinkage occurring in US stock market. Observing a considerable decline in the size of US market they applied a political economic model for delisting. Unlike the private and social benefits associated with delisting it create a very negative impact on individual investor's participation on corporate profits. This will further undermine a support for business friendly policies. This results in volume reduction and huge shrinkage in U.S. stock market which ultimately reduce the size of investment, production and employment.

Angelini and Foglia (2018) examined the short and long run equilibrium relationship that exists among external factors and the IPO from UK market. The study applied two methods Granger-causality (conventional approach) and the TodaYamamoto test (TY) was to examine the direction and the casual connection amongst macro determinants and IPOs number. The outcome indicates that causal relationship exists among variables which shows that market volatility, rate of interest and industrial production have Granger cause with frequency of IPOs. This is different from TodaYamamoto test (TY) where only the market volatility impacts the occurrence of IPO.

Meluzín, Zinecker and Kovandová (2019) analyzed how number of IPOs in developing market of Poland affected by the macroeconomic factors including growth rate of GDP, growth rates of industrial production, the reference interest rate, Warsaw Stock Exchange Index (WIG) and the volume of private equity investments. It is observed that there is a substantial difference occurs primarily among the IPO number and GDP growth rates, and other among the IPOs number and growth rates of industrial production.

A study conducted by Thanh and Hguyen (2020) evaluates how number of IPOs, the number of newly registered IPOs and number of IPOs withdrawn from the market are affected by macroeconomic uncertainty. This study unveils microeconomic uncertainty has a vigorous

and adverse effect on the activities of IPOs. The reduction in the number of newly formed IPOs and a surge in the number of withdrawn IPOs are the major contributors in the lesser number of IPOs. The findings of the present study reveal that it's healthier to wait for IPO during the periods of macroeconomic uncertainty.

Under the study by Mehmood, Rashid and Ahmad (2020) that tried to observe the explanatory power and dynamic relationship between macroeconomic and capital market variables on the number of IPOs that are registered in Pakistan's stock exchange. They have found that different macroeconomic factors like inflation, GDP growth, political certainty and rate of interest are responsible for firm's decision to go public for IPO. Moreover, these macroeconomic factors have significant positive relationship with IPO activity which means if these macroeconomic factors increase they will also enhance the activity of IPO. On the other hand, rate of interest and underpricing of IPO are negatively correlated with no. of IPOs. Moreover, the recent study also reported the factors having quadratic relationship with no. of IPOs. The findings of this quadratic model further explained that the link between no. of IPO and interest rate is a bowl-shaped curve, whereas the link between political sustainability and IPO numbers is U-shaped. The reason for this non-monotonic association between IPO numbers and political sustainability is due asymmetry information.

Mazumder and Saha (2021) examined the effects of panic created by COVID pandemic with regard to initial returns of IPO, a rise of 9.30% in initial IPO returns have been seen in 2020 as compared to the preceding forty years. They examined the sensitivity of the initial returns as a result of COVID pandemic despite the increase in the initial IPO returns. They discovered that initial IPO return is adversely linked with the pandemic fear by using fear index. Further, newly established firms are more affected by the public pandemic fear than the mature firms, even after deteriorating balancing.

Salerno (2021) wants to examine what features prevailing in different affect the decision of going public and how initial public offering, profitability of firms and is affected by the cultural norms in different countries and threat of financial crises. First, firms are more prospective to opt for IPO in result oriented countries as compare to the tradition-oriented countries where firm are reluctant to go for IPO. Second, the decision of going-public is also affected by the country features including financial expanding and taxation .Further, firms have encouraging profitability and face less stress of financial crisis that operate in traditional and result oriented countries. This research is specifically developed for policymakers and managers in European and Asian countries, who are interested to enhance their knowledge regarding the indicators that play important role for the firms' decisions to opt for IPO, face various phases during their lifecycle.

According to the study published by Adra (2021) it is examined that effect of exogenous monetary shocks' on the market of IPO with the help of a strategy called high-frequency identification. There is a drop in the activity of IPO as result of Contractionary shocks. On the other hand, there is expansion in the activities of IPO when Contractionary shocks disseminate healthy economic information. The effect of monetary policy is positive on the market of IPO by splitting the conventional monetary shocks from central bank information shocks.

The literature on economic condition, stock market development and growth of IPOs is also limited. Mostly the researches conduct on finding the link between stock market and economy (Hou & cheng, 2017; Pan & Mishra 2018; Liu & Zheng 2015). The studies on how growing economic needs linked with more funding requirements especially with respect to equity offerings are very few. Therefore the second part of the research shed light on growth of stock market and economy and their consequences of IPO event. Here the study determines if any relationship exists between IPO and external factors (stock market and economy). Again the previous literature on this relationship is mixed. Like Ameer (2012) reported that number of

IPOs negatively affects interest rate but positively affect industrial production in Malaysia. Angelini and Foglia (2018) documented a long run relationship between number of IPOs and business cycles, volatility and interest rate but not associated with stock market returns in UK market. Similarly Mehmood et al., (2020) documented a significant positive relationship between number of IPOs with GDP and political stability whereas significant negative relationship with interest rate and underpricing in Pakistan. Therefore it is important to see whether IPO is more of economic event or more close to stock market which conduct this event.

### **2.2.3 IPOs in Pakistan**

There are some studies conducted on IPOs in Pakistan up till now. Mostly the work has been performance of IPO firm after the IPO event. This performance is mostly measured in terms of abnormal stock returns received by the investors after the IPO event.

Sohail and Nasr (2007) have documented the short and long run performance of 50 Pakistani IPOs and found mean underpricing of 35%. Further this underpricing has been determined through information asymmetry, offer size, market capitalization and over subscription. Rizwan and Khan (2007) analyzing short and long run price behavior of IPOs keep in view the phenomenon of privatization from 2000 to 2006. They further provide evidence of better performance of public sector IPOs than private sector in long run. Keep in view three states of economy i.e. normal, boom and recession from 2000 to 2009 in Pakistan. In later years Javid and Malik (2016) conducted another study while comparing the underpricing phenomena of privatized and private IPOs.

Similarly, Kayani and Amjad (2010) conducted another study where they analyzed the relationship between pre and post IPO with underpricing and investors interest. Taking a sample of 59 IPOs from 2000 to 2010 they have reported underpricing up to 39 % and also

found a significant positive relationship between IPO initial returns and investors interest. In recent years Mumtaz and Ahmed (2014) presented their work on determinant of IPO underpricing. Taking a sample of 75 IPOs from 200 to 2011 they have noted short term over performance of IPOs from first to 13<sup>th</sup> trading day. In addition, Mumtaz, Smith and Ahmed (2016) found a short run performance of IPOs in Pakistan. Observing a 3 month post IPO period they have found a considerable level of underpricing. Utilizing (Extreme Bound Analysis) EBA technique to find 15 determinants of IPO underpricing their study found investor sentiments and underwriter prestige is supportive one whereas ex-ante uncertainty found to be irrelevant. Another study conducted on short run performance of IPO in a different context by Sohail and Raheman (2010) by taking 73 Pakistani IPOs. They have applied the phenomena of short term underpricing in three states of economy i.e. Normal, Boom and Recession. Overall Pakistani IPOs out performed in short run in all states of economies but aggregate returns in boom are far better than recession state of economy.

While conducted study on long run performance of IPOs Mumtaz, Smith and Ahmed (2016) reported an under performance of IPOs. They argued that dislocations have been found between underwriter valuation for IPO and price set by the market in long run. Another study conducted by Sohail, Bilal, Lala Rukh and Fatima (2016) conduct study on underpricing of IPO in long run up to 12 months' time. The sample selected of 26 Pakistani IPOs from 2010 to 2015. Taking market volatility and market capitalization as explanatory variables against underpricing of IPO they have found both variables have a significant positive impact on underpricing. Similarly Khan, Ramakrishnan, Haq, Ahmad and Alim (2017) conducted a study to see the long run performance of IPOs in Pakistan. While applying Buy and Hold Abnormal Returns (BHAR) they take both equally weighted and value weighted samples. Both sample show Pakistani IPOs under performance in long run up to 3 years.

Mehmood, Rashid, Ahmad (2020) examined the pricing mechanism which results in over-subscription of initial Public Offerings (IPOs) in Pakistan. In a cross sectional settings, they have taken 85 IPOs from year 2000 to 2017. They have applied the method of ordinary least square (OLS), robust and quintile regression to analyze the factors responsible for IPO shares over subscription. The results show that pricing mechanism is the major cause behind IPO over subscription. When an IPO form applying fixed price mechanisms it signals huge information asymmetry and uncertainty in investors mind, which ultimately offset with underpricing. This expected underpricing leads to high level of over subscription. The study also recommends that the investors should not ignore the information available in prospectus before deciding to invest in new IPO. They also recommend issuers to consider book building process instead of fixed price mechanism to control high level of underpricing and improve the price efficiency of IPO.

The study conducted by Anwar and Rashid (2021) discovers the relations among pricing mechanism and initial public offerings' flipping activity in developing economy of Pakistan. The study has taken a sample of 95 firms that are listed on the Stock Exchange in Pakistan covering a period from 2000 to 2019. The ordinary least square and quintile regression methods were used by this work to identify the relations among price mechanism and flipping activity. The outcomes demonstrate that IPOs that are book-built flip significantly less than IPOs that are fixed price. It is in line with the signaling theory assertion that information is dissemination by the underwriter to attract potential investors and fix the offer prices of Initial Public Offerings. If the fair prices of IPOs are known by the potential investors, then offer prices have been set closer to the intrinsic values, consequently decreasing flipping. To understand the effectiveness as well as more related information about the pricing mechanism, convincing evidence was delivered by this study. Specifically, it offers a tool for the better clarity of how actually pricing information is used by the companies in the flipping of shares

of IPOs. Underwriter and regulators can take the benefits of these findings, such as, choices are provided to underwriters for the allocation of IPO shares and the Securities and Exchange Commission of Pakistan (SECP), for the revision of regulations for the disclosure on methods for the IPO pricing.

Another research conducted by Khan, Ramakrishnan, Haq, Ahmad and Alim (2018) to investigate the determinants of underperformance of IPOs in long term in Pakistan Stock Exchange. They are using the event study methodology of buy-and-hold adjusted returns (BHAR) while keeping both equally-weighted (EW) and value-weighted (VW) settings to calculate the performance in long term. Furthermore, this research adopted three regression models namely ordinary least square (OLS), LOGIT and PROBIT methods to examine the IPO's performance in long term. Based on proposed analysis techniques, this study discovered a substantial decline in performance of IPOs in Pakistan in long term. Moreover, this long term underperformance of IPOs in Pakistan is affected by various factors namely initial stock returns, under-writer prestige, over-subscription ratio, dynamic condition, market condition, and investor's sentiment. The study also documented significant difference of opinion among well-informed and un-informed potential investors in Pakistan.

Another study conducted by Sohail, Raheman, Zakaria and Farhat (2018) to analyzed the IPO performance in a risk adjusted settings taking 83 IPOs from Karachi Stock Exchange (KSE). They explained the phenomenon of underpricing and its determinants by utilizing asymmetric information and signaling theory. They have found an underpricing 28.28 % in Pakistani IPOs, which clearly indicates that investors can make 28.28 % market adjusted profit from IPO activity on average. Like previous research they have found in decline in performance of IPO firms in subsequent years after listing. While conducting sector wise analysis they have observed underpricing in all sectors except personal goods, equipment, hardware and technology and equity investment. In order to find the robustness of the finding they also

measured the risk adjusted performance of IPOs by applying 5 different models. The level of underpricing is captured by all models. Market adjusted model reported 39.64 %, market model shows 42.31 %, CAPM shoes 42.84 % and FF 3 factor shows 42.99 %. Though results are different but variation is almost minimal which indicates that selection of model is indifferent while analyzing IPO under performance.

Recently Rasheed, Sohail and Din (2019) conducted a study to find out the motivation for a firm to go public. In order to find this objective they have compared the pre and post IPO firm performance. They have applied a panel probed regression by taking a sample of 70 IPOs from Karachi Stock Exchange (KSE) for a time span of 14 years from 2000 to 2014. They estimated the key elements which are responsible for a firm to go public are firm big size, optimal level of sales growth and profitability, industry Market to book ratio and firm level general trade features. They concluded that firms decided to go public in order to achieve a dilution in ownership, diversification of risk, reduce the level of outside monitoring, to fulfill their financial requirement and to optimize their capital structure.

Wahid, Mumtaz and Mantell (2020) argued that the projection of IPOs' future cash flows is not only difficult but impossible to predict because history of publicly disclosed financial information is missing with majority of IPOs. As a result, IPO valuation is more complex as compared to valuation of seasoned equities in any market; therefore they resolved the issue of IPO valuation in the Alternative Investment Market. By applying Ordinary Least Squares (OLS), least absolute shrinkage and selection operator (LASSO) regression, and Extreme Bounds Analysis (EBA), the study found variety of elements are associated with the IPOs valuation in the AIM. After market earnings per share (EPS), per share operating cash flow, and the %age of shares that are issued to general public are included in the study. The results of this study provide useful guidance to potential investors who are more interested in AIM for purchase of IPO stock.



Alim , Khan ,Iqbal and Haider (2020) studied the cyclical patterns of hot and cold issue in Pakistani market while taking a sample of 77 non-financial IPO firms listed firms in Pakistan Stock Exchange. In addition, they analyzed firm level, industry level and country level factors which are responsible for a firm to decide to go public. They used the volume and initial abnormal returns as proxy for IPO and applying logit model to find the IPO decisions in cyclic pattern. The findings revealed that the year 2003 to2005, 2007 and 2014 and 2015 were considered hot in Pakistan, whereas, other years during study period found as cold issue market. In addition, Pakistani market experiences more IPOs with high initial returns in hot issue market. In addition, IPOs in hot market issues are experiencing more underpricing as compared to cold issue. They also reported the significance of firm, industry and country level factors which affects the firm decision to go public specifically during hot issue market.

A research conducted by Mumtaz and Yoshino (2021) investigates how the short- and long-term performance of Initial Public Offerings is affected by the firm's greenness. They developed the Greenness Index that is established on the emissions produced for the calculation of firm's greenness. It is noted that greenness is higher for the firms that operate in services and financial sector as compared to those operating in other sectors. They classified the sample into high and low green firms in order to investigate the short- and long-run performance of IPOs. They observed that firms with high greenness achieve low return as compared to those with low greenness in the short run but in long run the effects are opposite. Overall, the study emphasize that investors take part in firms with high greenness for the optimization of their portfolio.

According to the study conducted by Mumtaz and Smith (2021) that examines the cycles in Pakistan and US. The study did not discover any proof for lead-lag relations exist among volume of IPO and initial returns in Pakistan, but they are exist in US market.

These studies are very important and shed light on IPO performance in terms of their stock returns after the IPO event. However, they did not measure the operating performance in terms of sales growth, profitability and market share of the IPO firms as pre IPO event data is not available and most of the firms are registered as public limited firms and therefore no history before IPO. Moreover, the present study is different from the above mentioned studies which only focusing on how IPO firm behave after the IPO event. Unlike these researches, the aim of present study is to see how IPO event impacts its industry rival firms and how IPO event change the overall industry dynamics. The summary of literature in tabulated form is as under;

**Table 2.2 : Tabulated Evidences of the Relevant Literature**

<b>Research Objective</b>	<b>Author</b>	<b>Research Methodology</b>	<b>Research Variables</b>	<b>Unit of analysis</b>	<b>Findings &amp;Results</b>
Intra industry impact of timing of security earnings	Ayers and Freeman (1997)	Cumulative Abnormal Returns (CARs)	Capital markets, Earnings	Capital market	Focusing on timing they have found inter- industry returns based on performance comes and gone early as compared to intra- industry returns based on firm's within industry. They suggested forecasting inter- industry earnings first followed by inter- industry earnings if a firm wants exceptionally high profits.
Intra industry impact of REIT on Industry rivals	Chan, Chen and Wang (2019)	cumulative market- adjusted abnormal returns	Stock Returns	Real Estate Investment Trust (REIT)	Found the significant intra industry impacts of REITs on its rival REITs.

Hedge fund activism effects its industry rivals through product market competition	Aslan and Kumar (2016)		HF productivity, cost and capital allocation and product diversity	Hedge Funds	How hedge fund activism (HFA) effects its industry rivals through product market competitions. On average they have found HFA exerts negative effects on real and shareholder wealth.
Intra industry IPO impact from supply chain mechanism.	Kutsuna et al (2016) .	Event study, AR	firm's growth rates of revenue, cash, and, PP&E	IPO suppliers firms	Unlike rival firms the trading partners get benefit from firm's IPO. The reasons they have found for such positive impact are due to increase in demand which is benefitted to IPO suppliers.
Gauged intra industry impacts of IPOs using rival firms multiples.	Purnanandam and Swaminathan (2004)	BHAR	Price to value, price to sales, price to earnings	IPO firms	Found an IPO firm is overvalued more than 50 % as compared to its industry rivals.
Analyzed the impact of IPO event on its industry rivals stock returns in long-run.	Akhigbe, Johnston and Madura (2006)	BHAR	Industry homogeneity, intensity, regulation, concentration, financial and operating leverage, run up, valuation	IPO and industry rival firms	Found an unfavorable share price movement of rival firms on average over the 3 years period after the occurrence of an IPO.

How inclusion of new assets effect existing price assets?	Braun and Larrain (2009)	Market adjusted returns, regression	IPO covariance , industry returns	common equity primary IPOs	Noted that portfolios with high IPO undergo a reduction in prices as compared to other portfolios during the time of issue. Moreover, in less integrated international markets, the impact is stronger with bigger IPO. Thus support the hypothesis that asset supply create a considerable impact on asset price.
Analyzed the impact of IPO event on technology firm's specifically related to computers.	Lee et al. (2011)	T-test, Panel regression.	Auditor reputation, initial returns, market momentum, market risk, market states.	IPO firms	Their findings revealed the IPO results in positive information spread out in more efficient way on already listed firms in the similar product market as compared to already listed firms in associated product markets. Further R&D expenses impact valuation positively while industry concentration negatively.
How Australian IPOs create intra industry impacts on their industry rivals?	McGilvery, Faff, Pathan (2012)	AR, CAR, Panel Regression	Board size, CEO share ownership , rival firm returns.	IPO firms and Industry rivals	IPO rival firms experienced a deterioration in their share prices in short run. It is also noted that rival firm's negative performance associated with IPO firms corporate governance and if IPO firm disclose its objectives of proceeds receive from IPO

Compare IPO firms and their rivals firms in terms of allocation funds and cost of goods sold expenses.	Levesque, Joglekar, Davies (2012)	Regression analysis	SG&A, R&D and COGS expenses, firm's revenue	IPO firms and Industry rivals	The result specified a production function which is responsible for creating association amongst resource allocation with research and development and cost of goods sold to firm revenue. It further shows that IPOs firms resource allocation pattern is significantly differ from well established existing firms.
If IPOs as bad news to existing firms in the same industry than what is the rival firms startegy?	Nguyen and Sutton (2014)	Tobit and Probit model	IPO threat, Past Concentration	IPO firms and Industry rivals	Rival firms use stock repurchases to correct for the market's overreaction to the IPO threat. These IPO-induced repurchases are stronger when the rival firms are in a concentrated industry and experienced poor stock performance in the previous year.
Impact of IPO firms on its rival while considering tax avoidance behavior of rivals firms.	Chen, Francis and Wu (2016)				Their results confirm a strong relationship exists between IPO and rivals firms tax avoidance behavior.

To see intra industry impacts of IPO on its rival firms by applying dynamic oligopoly model	Spiegel and Tookes (2016)	dynamic oligopoly model	sales growth, market share, industry size	IPO and industry rival firms	Found a decline in rival firm's performance and cause for such deterioration is a competitive advantage attained by newly listed firm over the exiting firms. Further this decline is due to increase commoditization by newly listed firm. In addition IPO has a power of predicting future changes within industry but donot have ability to cause them.
Examined intra industry impact while considering the existence and withdrawal of IPO.	Hsu, Reed, Rocholl (2010)	wilcoxon test, Panel Regression	sales groth, capital exp. Growth, operating income growth,	IPO and industry rival firms	A positive effect occurred on existing firms share price when IPO firm withdrew from industry. The elements which gave an IPO a competitive edge over its industry rivals are recognition from financial institutions like investment banks during IPO, signaling a low level of leverage financing, and having an immense level of knowledge capital which create an operational difference.

How market liquidity affects the happening or non-happening of IPOs.	Bessembind Hao and Zheng (2014)	logarithms Models	Market Liquidity	IPO firms	They find a non-happening or lesser IPOs are due to combination of fundamental values uncertainty or information asymmetry at a greater extent which leads to market failure. Due to such competitive liquidity provisions which result in either less number of IPOs or highly discounted in their offer prices.
How earnings quality (EQ) is affected through new market entrants and by the existing rival's firm within an industry.	Majeed (2016)	HHI and Panel Regression	TA , $\Delta$ REV, $\Delta$ AR,PPE represents property, plant and equipment	IPO and industry rival firms	The study finds a significant positive relationship exist between product market competition and earnings quality of a firm. Firm's corporate governance and management decisions are affected through product market competition when it relates to financial reporting.
How signaling power of corporate innovation impact during IPO process.	Signori (2016)	Cross section OLS	Size of R & D investment, Liquidity, Leverage, Profitability	High tech IPO	IPO firms attained greater liquidity in the aftermarket with more R&D investments. Further investors prefer those IPO firms having greater innovation potential.
How industry rival firms belong to same geographical area within concentrated industry impacts share prices IPO firms.	Harris (2016)	Event studies were used to measure abnormal return and abnormal volume, Multiple regressions	ROE, abnormal returns, volatility and holding period return	IPO firms	IPO conducted in more concentrated industries are more underpriced in comparison with IPOs in less concentrated industries due to competitive pressure which results in risk profile of IPO firms.

How market cause for the over reaction of IPO initial returns?	Deng and Zhou (2016)	t-test, 2SLS, Garch	IR, MIR	IPO firms	They found an overreaction by IPOs for 21 <sup>st</sup> days return. First day returns is more affected through short term and market factors while 21 <sup>st</sup> days return is more affected through IPO firms own fundamentals. Moreover this over reaction is weakly time varying.
How assets returns of a firm are affected through product market competition.	Bustamante and Donangelo (2017)	HHI and OLS	Book to Market, Operating leverage, dynamic interaction between firms inside and outside the industry, productive technologies, suppliers, workers, and customers, as well as aggregate economic conditions	Public and Private firms	Firms having little opportunities for excel if they belong to highly competitive industry. Such firms are affected in two ways. First, lower growth results in lower profits leading to systematic risk. Secondly, their low profits also exposed these firms to systematic shocks.

### 2.3 Literature Gap

IPO is one of the most important event happened in the life of a firm. A lot of empirical work has been done on analyzing how IPO event affect the firm itself and results were drawn in terms of the IPO firm Pre/Post performance. As a firm specific event, IPO has been discussed through different aspects like underpricing, initial and long run stock returns, ownership structure, issuance methods, underwriter’s reputation and earnings management etc. Researchers analyzed the implications of such elements on firm’s IPO decision (Coakely, Hadass and Wood, 2007; Lowry, Officer and Schwert, 2010; Vismara, Signori



and Paleari, 2015). This is no doubt helps the management within the organization to understand whether to conduct an IPO or not? But how IPO event affect the external environment and how external environment affects IPO decision is ignored so far. So there is a need to discuss the IPO implications on other firms, industry and economy as a whole.

The research emphasis on IPO event and its impact on industry competitive environment through various aspects like operating performance, stock returns, liquidity position, share price volatility, leverage and industrial composition (from monopoly to perfect competition). These external implications in respect of an IPO event are still unexplored and only few studies have been done in the last two decades which shed some light on this phenomenon. IPO intra industry effect has been noted down in few research earlier (Ritter, 1991, Akhigbe et al. 2003, 2006; Hsu et al., 2010; Peller, 2013). However their findings are not in line and presented contradictory results of IPO on its industry rivals. Like Ritter (1991) explained IPO as a positive signal for its industry rival. Similarly Eckbo and Norli (2005) reported IPO stock under perform as compared to their same size matched firms from 3 to 5 years' time. Whereas, Akhigbe et al., (2006), Hsu et al., (2010), Chod and Lyandres (2011) and Chemmanur and He (2011), Mcgilvery et al., (2012), Peller (2013) and Spiegel and Tookes (2016) have found negative impact of IPOs on competing firms performance. The work of Hsu et al., (2010) with the name "The New Game in Town" where the study reported significant negative impact of IPOs on its industrial rivals is challenged by the recent work of Li and Zhang (2021) with the name "Another Game in Town". Contrary to previous one, the research of the later study documented the positive effects of IPOs on its industry counterparts. The past and recent past literature on IPO intra-industry effects open the debate whether IPO effects are insignificant or significant? Even if impacts are significant then either they are positive or negative?

In Pakistan there are few studies conducted on IPOs and most of them taken IPO as firm specific event and focused on internal implications of IPO (Rizwan and Khan, 2007; Sohail and Nasr, 2007; Sohail and Raheman, 2007, 2010; Mumtaz Smith and Maqsood, 2016).

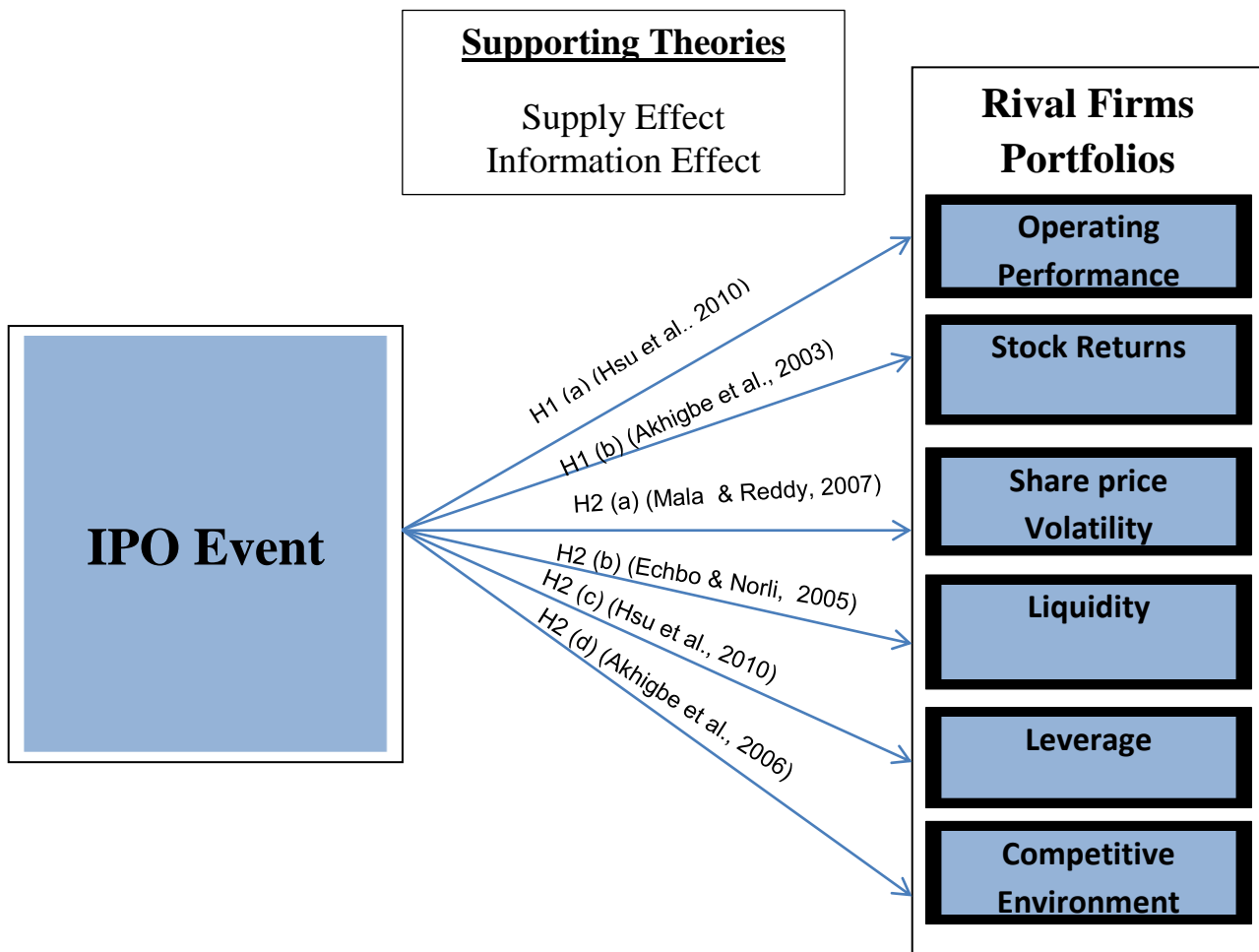
Similarly the previous research were limited to stock returns and operating performance of rival's portfolios but the present research also analyzes how IPO affects the liquidity and leverage position of its rival firms. These dimensions help us to understand the operational efficiency of IPO and its rival firms in more depth besides profitability comparison. In addition the present study also includes share price volatility of rival firms stock as compared to IPO firm to in-depth analysis of risk and returns. The study also analyzes the competitive effect in terms of industry composition and sees whether IPO effect is more or less stronger in competitive or less competitive industry environment? The study also included inter-industry impacts of IPO. As the name indicates it is different from Intra-industry which document the performance of rival firms operating in the same industry whereas the inter-industry performance shed light on comparison among industry in terms of IPO effects and see which type of industry is more affected through IPO?

The second part of the research shed light on economic consequences of IPO event. Here the study determines if any relationship exists between IPO and external factors (stock market and economy). Again the previous literature on this relationship is mixed. Like Ameer (2012) reported that number of IPOs negatively affects interest rate but positively affect industrial production in Malaysia. Angelini and Foglia (2018) documented a long run relationship between number of IPOs and business cycles, volatility and interest rate but not associated with stock market returns in UK market. Similarly Mehmood et al., (2020) documented a significant positive relationship between number of IPOs with GDP and political stability whereas significant negative relationship with interest rate and underpricing in Pakistan.

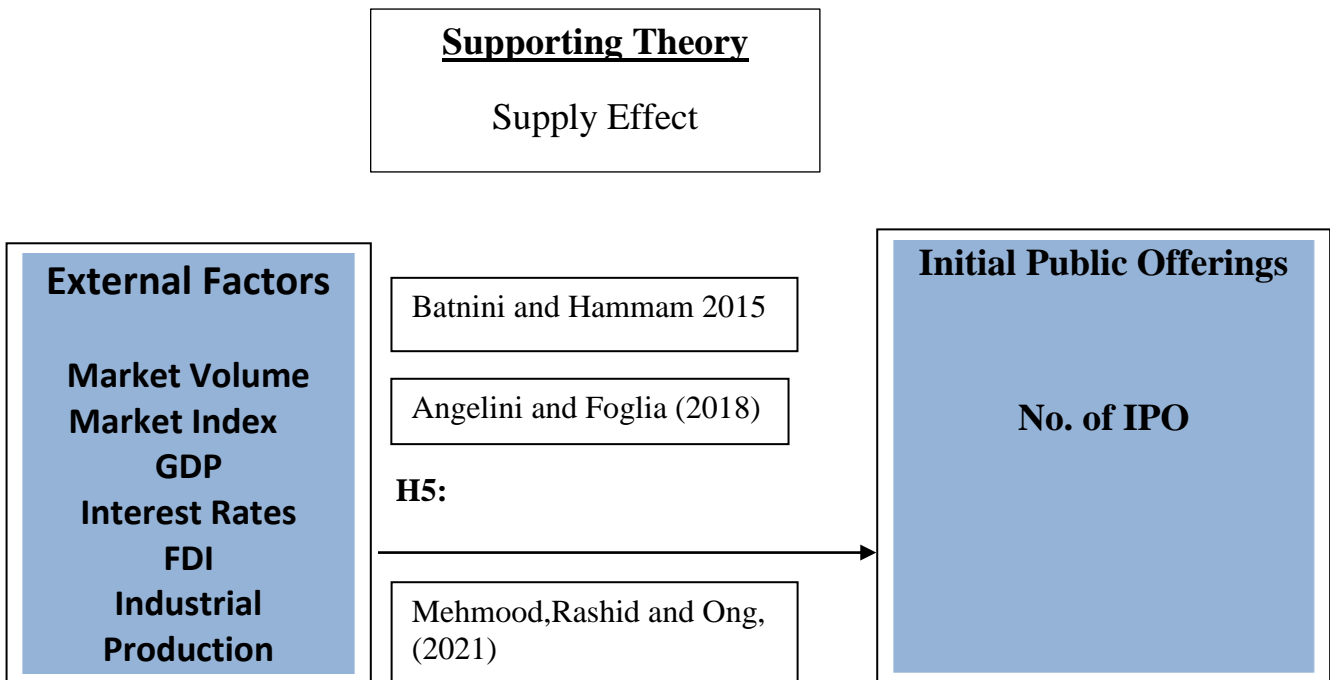
These finding will further help us to understand the reasons for few listings of IPOs in Pakistan where market index claim a huge success story reaches up to 50000 points in January 2017 but other micro and macro-economic variables don't support such results.

## 2.4 Theoretical Framework

Figure: 2.1 IPO intra-industry impact on rival firms



**Figure 2.2: Relationship between IPO and External Factors**



## **2.5 Research Hypothesis**

In order to address the first objective of the study that is, how IPO impact its relevant industry performance? The performance is further divided into, share price performance and operating performance industry rival firms after the IPO.

One of the important element of the present study is to determine the intra- industry stock returns effect by IPO. This was first noted by Ritter (1991), who reported a positive impact of IPO on its industry rivals due to investor's optimism. However recent studies denied a positive intra-industry effect of IPO. Akhigbe et al., (2003) while incorporating information and competitive effect found insignificant relationship between IPO and its rival firms stock returns in short run. However, Akhigbe et al., (2006) found a declining in rival firms' portfolio after the occurrence of new IPO in their industry in long run. In addition Braun and Larrain (2009) documented a decline in rival firms' portfolios returns in one month time after IPO. We therefore hypothesized that IPO bring significant effects on rival firms' stock returns in short and long- run. Similarly, Mcgilvery et al. (2012) measure the impact of IPO event of industry Cumulative Abnormal Returns (CARS) and found it negative.

**H 1 (a): The occurrence of IPO creates negative impact on rival firm's performance (Stock returns) competing in the same industry.**

Many researchers gauged the post IPO operating performance in their research like (Cai and Wei 1997; Coakley, Hadass and Wood, 2004; Huang and Song, 2004). However their studies belong to IPO firm only. Otchere and Chan (2003) have found a significant negative effect about privatization of Common Wealth Bank of Australia (CBA) on its counterpart. They have also noted a reduction in CBA cost and improvements in its profits after privatization which also outperform its rival banks operating performance. Similarly Chen, Li and

Moshirian (2005) have found the same deterioration in operating performance of other banks after the privatization of Bank of China Hong Kong (BOCHK).

More specifically, while determining intra industry effect of IPO on rival firms from operating performance point of view we found limited research. Hsu et al., (2010) is the first group of researchers who examined this effect. They have noted a considerable decline in operating performance of rival portfolios after the occurrence of IPO in their industry. More recently Li and Zhang (2021) found a significant positive impact of IPO event in its rival counterpart within the same industry. Foucault and Fresard (2014) measure find the impact of peer firm's valuation on stock prices of a firm. They used Tobin Q as a proxy for measuring stock prices. They found a decline in sensitivity of firm's investment with respect to their peers after going public. In another study, Henry (2022) reported a low sales growth, Return on sales and Tobin q of rival firms after IPO, if they were having low cash flows and high leverage before IPO. Based on these mixed opinions previous, we hypothesized that;

**H 1(b): The occurrence of IPO creates negative impact on rival firms operating performance (ROA, ROE & Tobin Q) competing in the same industry.**

It is also important to see how an IPO event affects the industry rival firms short term liquidity position (working capital requirements)? In IPO literature liquidity is mostly measure in terms buying and selling of shares of the overall market and its impact on newly listed firm shares trading. Ellul and Pagano (2006) explained, how IPO firm affected through liquidity of the market? They argued if post IPO market is expected to be less liquid, then IPO tend to be more underpriced and vice versa. On the other hand Herawati (2017) measured the impact various performance measure of IPO firms like ROA, liquidity (working capital requirements), leverage, activity ratios on IPO initial returns. He found ROA, liquidity, leverage, activity and capital market ratio has a significant impact on IPO initial returns. Similarly Banerjee, Guha and Bandyopadhyay (2016) analyzed how financial ratios affect IPO

firm's credit rating? Their study revealed that Profitability, Liquidity (working capital requirements), and Interest coverage ratio affect IPO grading in a significant manner. Based on these studies we construct the following hypothesis.

**H2 (a): The occurrence of IPO decreasing rival firms short term liquidity position.**

Leverage and its impact on new issues have been covered by many researchers like Baker and Wurgler (2002) explained timing of IPO with respect to book to market ratio. His findings reveal that low leveraged firm raised funds through IPO when their valuations are high whereas high leveraged firms time their IPO when their valuations are low. These variations in firm's valuation have direct consequences on capital structure. Similarly, Kim and Lee (2007) negate the assumption that a high leverage depicts a positive sign of firm's quality in pre-listing era by compelling management to allocate fewer funds for listing activity due to budget constraints. He argued that high leverage only portray a sign of superiority for low technology IPO firms', which is reflected through minor price revisions and lesser under-pricing. Leverage oppositely effect high technology firms and high degree of leverage means increased risk and uncertainty which is reflected through huge price revisions and high under-pricing. Hsu et al., (2010) documented direct outcomes of the IPO on issuing firm capital structure which generally comes as a low debt to equity ratio. This low level of leverage provides an opportunity to issuing firms against their more leveraged competitors and providing them more flexibility in their investments.

**H 2(b): The occurrence of IPO creates significant impact on the leverage requirements of competing firms in the same industry.**

Schwert (2002) explained investor's irrational behavior while valuing stock. He also noted the volatility is more prominent in small firm's stock prices with more growth opportunities. While comparing the two elements firms size and growth opportunities in explaining share



price volatility, he found growth opportunities (technological advancement) bring more volatility. Sherman (2005) explaining aftermarket IPO shares volatility compared book building and auction method used in IPO process. His study revealed that if book building depicts more underpricing compare to discriminatory auctions, which leads to less volatility in shares trading afterwards. However, Pettway, Thosar and Walker (2007) while study Japanese IPO found contrary results and reported IPOs with book built process exhibit more under-pricing and greater aftermarket volatility in comparison with discriminatory auctions. Vong (2007) analyzed the data by taking a big sample of IPOs in Hong Kong and criticized the well documented association between initial returns and their ex-post volatility. He found offering rate for subscription holds vital information in itself and IPO share price volatility is linked with the unpredicted elements exist in subscription rate. Recently Loughran and McDonald (2013) have noted the IPO filing with SEC and point out its inability in portraying the firms' business strategies and its operations. This would ultimately results in declining investor's ability in assessing IPO. They also reported IPOs having more of uncertain text getting huge first-day returns with indefinite offer price revisions and successive volatility.

The general idea is that the uncertainty in stock market can be a disincentive to conduct an IPOs. Theory suggests a positive correlation between volatility (see Schill, 2004; Pastor and Veronesi, 2005), and consistent empirical evidence (Lowry and Schwert, 2002; Bruce, 2014).

The above literature indicates that so for IPO studies share price volatility was only gauged while considering IPO event itself. The present study is the first one which is going to measure the impact of IPO on its rival firms share price volatility. Therefore the study builds the following hypothesis;

**H 2(c): The occurrence of IPO creates significant impacts on share price volatility (either negative or positive) on its competing firms in the same industry.**

When we focus on intra industry environment for IPO we mainly discussed competitive effect which is drawn and bear by IPO firms from its industry counterparts. There are few research which describe competitive effect. Zahra (1996) analyzed biotechnology firms and reported a positive relationship as being a pioneer in their industry and return on assets, sales growth and market share. In a similar manner Wilbon (1999) while applying Tobin's Q method reported that pioneering firms' in IT sector have a better post-IPO stock performance. In addition, Wilbon (2003) analyzed whether competitive stance influenced performance in high technology industries. Their results further reveal that IPO firms' with more pioneering status show high performance in short-run. However, he did not find any significance of competitive position on aftermarket IPO performance even pioneers outperformed followers. Competitive environment is also affected by market timing of IPO. Kor, Mahoney and Watson (2008) examined how demand fluctuations, competitiveness, and technology uncertainty within industry affects the intensity of IPO firms' monitoring by board outsiders and institutional investors. By testing a sample of IPO firms' from twenty four manufacturing industries in America, their findings revealed that corporate governance mechanisms significantly impact industry uncertainty. The results also show that IPO firms' board monitoring and institutional investor ownership are significantly affected by industry and consistent for demand and competitive uncertainty.

Pagano, Panetta, and Zingales (1998) analyzed a sample of Italian IPOs and found more chances of new IPO with increase in its size and the market-to-book ratio in the industry where the firms operate. Similarly Akhigbe et al., (2003) and Hsu et al., (2010) gave high weightage to IPO's competitive effect which have important implications for various agents like investors, industry competitors, and issuing firms. In recent studies, Chemmanur, He and Nandy (2010) while analyzing firm's choice to go public found product market competition as a significant factor. Similarly Chod and Lyandres (2011) and Chemmanur and He (2011) reported that post-IPO firms' performance is significantly influenced through competition in

the product market. Therefore product market competition is considered to be a powerful factor that affects an IPO dynamics.

**H 2(d): The occurrence of IPO affects the competitive environment by decreasing competing firms market share.**

It is now established fact that IPO firms under perform in short and long run in terms of their stock returns as well as their operating performance (Jain and Kini, 1994; Mikkelson et al, 1997; Kim et al., 2004; Zaluki, 2008). There are several reasons for this decline in performance like earnings management by IPO firm in Pre-IPO phase, deliberate underpricing to gain public attention by offering high abnormal returns after IPO. Although the literature on IPO intra industry affects is mixed but mostly studies documented that IPOs event results in negative performance of its industry counterparts (Akhigbe et al., 2006; Hsu et al., 2010; Spiegel and Tookes, 2016). This give rise to another debate; which is more affected through an IPO event; IPO firm or its rival firm? Therefore the study generates the following hypothesis:

**H 3: The occurrence of IPO declines the performance of its industry rivals more drastically as compared to IPO firm.**

The literature on IPO also shed light on how various industries respond to IPO event differently. Aigbe, Borde and Whyte (2003) found a negative impact of IPO event on highly competitive, more risky and high performing industries. In another study conducted by Aigbe, Johnston and Madura (2006) they found IPO intra industry negative price reaction is high in more regulated industries. Braun and Larrain (2009) reported IPO peer effect is stronger when market is less integrated and IPO size is big. Dong and Michel (2001) reported that IPOs provide high stock returns to investors if they belong to high growth industries. Rival firms more overreacted to IPO event if they belong to concentrated industry (Nguyen, Sutton &

Pham, 2014). In Pakistan's context, Mumtaz, Smith and Ahmed (2016) conducted industry-wise analysis of IPO underpricing. They found banking sector earned highest abnormal returns followed by engineering, technology and communications and power generations. Whereas, sectors like Textiles, chemicals and industrial materials and minerals incurred negative returns. Similarly, Sohail (2016) found all sectors in PSX experienced underpricing except equity investment, technology hardware and equipment and personal goods. In the light of these findings, it is important to find how IPO intra-industry impact taken by different industries.

#### **H4: IPO intra- industry impact varies among different industries.**

In recent years there is a huge fluctuations have been observed in the occurrence of IPO events and their frequency. Angelini and Foglia (2018) made a comparison in terms of no. of IPOs before and after dotcom bubble crises. They have reported that from year 2000 to 2003 during pre-dot com bubble crises 657 firms in UK were opted for IPO as compare to 1027 firms in 2004 to 2005 during post- dot com bubble crises. Similarly 294 IPOs were registered after the global financial crises of 2007 and 2008. This is the clear indication of volatility in occurrence of IPOs due to fluctuations occurred in macroeconomics environment. Due to this phenomenon, IPO frequency is varying from year to year. Therefore it is important to see is there any co-movement exist between IPO activity and economic conditions. The overall economic environment will change due to change in economic conditions of a county which ultimately affect the industry and firm performance i.e. cash flows and discount rate. This would definitely affect firms whether to go public or not?

Batnini and Hammami (2015) found that past stock market returns contains a significant relationship with number of IPOs. They further suggested that IPO firm manager analyze long term market yield and positive trend before deciding their firms to go public. Based on their finding the present study set the following hypothesis:

**H 5 (a): There is a positive relationship between stock market performance (Index) and number of IPOs.**

In finding the relationship between post IPO returns and market volume Vong (2007) found it is due to unexplored components of subscription rate offered during IPO. Packer and Spiegel (2016) have noted no effect of IPO activity on aftermarket trading volume of other companies stock. So these mixed results invite researchers to further study the impact of IPO on aftermarket trading volume on the overall market exist or not?

**H 5 (b): There is a positive relationship between stock market trading volume and number of IPOs.**

The study also analyzed the relationship between number of IPO follow closely with the economic cycle. In fact, when the GDP is high we expect that the volume of IPO will also be high because an increase in output leads to expansionary demand shocks in the economy (Choe et al.,1993). Firth (1997) measures abnormal stock market returns of unseasoned new issues on the New Zealand Stock Exchange. Substantial positive abnormal returns are obtained on the first listing day and this finding is similar to that reported in other nations. Initial market valuations are related to the profit forecasts contained in prospectuses. The provision of IPO profit forecasts in New Zealand is an important signal of company value. Long-run performance is measured by comparing the returns on new issues and returns on a benchmark made up of matched companies over periods of one, three, and five years. On average, the new issues significantly underperform the market. The level of long-term underperformance is significantly related to profit forecast accuracy, corporate earnings and cash flows, and growth rate. Most recently Mehmood, Rashid and Ong (2021) found a significant positive impact of GDP growth rate on IPO variation in Pakistani stock Market. On the basis of these findings the study constructs the following hypothesis:

**H 5 (c): GDP growth helps to increase the conduct of more IPOs.**

While analyzing the relationship between IPO and interest rates prevailing in the market, the present study found, firms are mostly going to public when the interest rate are high to reduce the debt cost and the opposite when it is low (Jovanovic and Rousseau, 2004). Recently Angelini and Foglia (2018) found interest rate contains explanatory power for the number of IPOs in UK market. Similarly, Mehmood et al., (2021) found increase in treasury bills rate will results in decrease in the number of IPOs. However, they have reported the significant positive relationship between Inflation and number of IPOs in Pakistan. Combining both T-Bill rate and inflation, we draw the following hypothesis:

**H 5 (d): There is a positive relationship between interest rate and the number of IPOs.**

Similarly Foreign Direct Investment (FDI) brings a positive impact on stock exchange (Shabbir and Muhammad, 2019). Another study conducted by Haider et al. (2017) where the study found a positive impact of stock market performance on FDI. Most recently Mehmood et al., (2021) found an insignificant impact of Foreign Direct Investment (FDI) on IPO numbers. The study changes the relationship a little bit and Foreign Direct Investment (FDI) has been taken against number of IPOs. Based on these studies the present study constructs the following hypothesis:

**H 5 (e): There is a positive relationship between FDI and the number of IPOs.**

Industrial production is another important macroeconomic variable which depicts the economic conditions of any country. Ghani et al. (2022) found the impact of certain macroeconomic variable and volatility of stock market and found all variable including industrial production have significant impact on aftermarket volatility. Umar and Nayan (2018) also found the same consequences of industrial production on stock prices of firms. Based on such result the present study hypothesize,

**H5 (f): There is a positive relationship between Industrial Production and the number of IPOs.**

**Table 2.3 Operational definitions of Explanatory and Explained variables**

<b>Explained variables</b>	<b>Expected sign</b>	<b>Calculation</b>
ROA = Returns on assets	–	Net income divided by total assets.
ROE = Returns on Equity	–	Net income divided by stockholder equity
Leverage = Financial Risk of the firms	+	Long-term debt to total assets.
Liquidity = Working capital ratio	–	Current assets to current liabilities
Volatility = variation in share prices	+/-	Measure through Standard Deviation.
CAR= Cumulative abnormal Returns	–	Measure the abnormal returns in short run.
BHAR= Buy and Hold Abnormal Returns	–	Measure the abnormal returns in long run.
Firm Age	+/-	From IPO to observation date.
Firm Size	+/-	
M/B = Market to book ratio	–	Market value of equity divided by book value of equity
HHI= Herfindahl Harishman Index	–	Sum of Square of the market share of every firm in the industry.
<b>Explanatory Variables</b>		
IPO Dummy	+	Measured through KSE-100 value-weighted index over three months prior to IPO.
GDP = Gross Domestic Product	+	GDP growth rate taken through SBP
IP = Industrial Production	+	Industrial production taken though FBS
IR = Interest Rate	+	Interest rate data taken from SBP
FDI = Foreign Direct Investment	+	Annual foreign Direct Investment
Market Index= PSX 100 Index	+	To measure the performance of stock market on one trading day
Market Volume = PSX trading volume	+	Number of shares traded in a single trading day.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This chapter explains the methodology in detail to measure intra-industry and economic measures of Initial Public Offerings. The chapter starts with research paradigm along with population and sample strategies. Then, portfolio construction of rival firm has been explained. Afterwards, the different techniques explained in detail which are used to measure the after event performance of rival firms. Finally, the techniques to measure the impact of external factors on number of IPOs have been explained.

#### **3.1 Research Paradigm**

The present study falls under paradigm of positivism. This approach focuses social science as well-organized way to club deductive logics and precise empirical observations (Neuman, 2003). This philosophy believes that human personal thought and ideas are administered through cause and effect. Moreover, social reality have stable patterns and knowledge is additive for them (Neuman, 2003; Marczyk ;DeMatteo and Festinger, 2005). Positivism further contains realist/ objectivist ontology and empirical epistemology, where more focuses on measurement of variables and hypothesis testing (Sarantakos, 2005; Marczyk, DeMatteo and Festinger, 2005). The study falls under scientific methodology of deductive approach and testing the theory.

#### **3.2 Population and Sample**

##### **3.2.1 Population**

The present study mainly focused on IPO firms and their effects on rival portfolios belong to same industry. Therefore the population selected for this purpose consists of IPO and their rival firms which are listed in Pakistan Stock Exchange (PSX) from year 1998 to 2016. The



reason for selected this time period is to take maximum number of IPOs for the study. Moreover, the study conducts 3 years pre and 3 years post IPO event analysis for long run. This means the time period is further extended to 6 years from 1995 to 2019. During this 25 years' time period Pakistan as well as the world economy gone through many ups and downs. This time covers post south East Asian crises of 1997-98, dot com bubble crises 1995 to 2000, Pakistan stock market crash of 2005, economic recession of 2007 and 2008 besides the normal and boom periods.

The total numbers of IPOs firms during this period are 109 belong to 26 different industries.

### **3.2.2 Sample**

A total of 109 IPO events were registered from year 1998 to 2019. However, the study uses different sample size for analyzing different impacts of IPO.

When the IPO intra-industry impacts measure for short run, the final sample reduced to 90 IPOs from 21 different industries and 337 IPO industry rival firms with following assumptions.

- Considered only those IPO events which offered common shares in IPO
- Considered IPO for the first time only. 2<sup>nd</sup> time IPO or Seasonal Equity Offerings did not included.
- If firms listed without IPO there were also excluded.
- Firms listed in all three stock exchange i.e. Karachi, Lahore or Islamabad, if not they were also excluded.

The excluded IPOs include National Bank of Pakistan (offering shares to public for the 2<sup>nd</sup> and 3<sup>rd</sup> time in years 2002 and 2003 respectively), Sui Southern Gas offer (which has already listed), Allied bank, UTP growth fund, PICIC Insurance, Colony Mills Ltd and atlas bank Ltd (which are listed without public offering). The major industries where IPO took place are; investment banks and securities companies with 17 IPOs, whereas technology and communication has 14 IPOs. Both sectors conducted highest IPOs in order to meet growing

demands for funds from the start of 21<sup>st</sup> century up till economic recession of 2007/08. Financial sector affected more drastically from economic recession worldwide during recession time and same is the case with Pakistan. Technology sector although effected from dot com bubble burst all over the world but still have a high demand because of the importance of services it offers and make itself shift from luxury to necessity. Therefore its demand is still exist. Other considerable IPOs occurred in Cement, Commercial banks and Power sector. These 3 sectors are also in high demand for Pakistan which encourages companies to conduct IPOs. Rest other sectors have an average 3 to 5 IPOs during this time in their particular industries.

When the intra-industry analysis conducted for long run the sample further reduced to 39 firms, belong to 19 industries and industry rival firms reduced to 217 firms. This is due to the following assumptions.

- Along with above mentioned assumptions for sample selection, for long run analysis, the study selected only those industries where 2<sup>nd</sup> IPO occurred after more than 3 years from the first IPO.

This technique is basically adopted to save the data form contamination, as industry already absorbed the effects of one IPO, so if 2<sup>nd</sup> IPO is conducted within 3 years' time, a true performance of industry cannot be measured (Hsu et al., 2010).

In order to find the impact of external factors (both market and economy) on numbers of IPO, the sample has been extended and taken from 1992 to 2021. During this time period a total of 413 IPOs were conducted but the final sample is taken for 394 IPOs. The excluded IPOs are either listed without IPO or offered preferred shares or listed in only one stock exchange or conducted 2<sup>nd</sup> IPO which is called Seasonal Equity offerings (SEO).

Table 3.1 mentioned below the year wise distribution of all 3 samples of IPOs i.e. for short run analysis 90 IPOs, for long run analysis 39 IPOs and for analyzing long run association between external factors and economy 394 IPOs.

**Table 3.1: Population and Sample Year wise distribution**

<b>Year</b>	<b>No. of IPO Firms (Population)</b>	<b>IPO Sample for short run</b>	<b>IPO Sample for Long run</b>	<b>Population for IPO and External Factors</b>	<b>Sample for IPO and External Factors</b>
1992				86	86
1993				38	38
1994				73	73
1995				41	41
1996				40	40
1997				4	4
1998	1	1	1	1	1
1999	0	0	0	0	0
2000	3	3	2	3	3
2001	4	4	1	4	4
2002	4	4	2	4	4
2003	6	4	3	6	4
2004	17	9	3	17	9
2005	19	14	3	19	14
2006	4	3	1	4	3
2007	11	11	4	11	11
2008	9	9	2	9	9
2009	4	4	3	4	4
2010	6	5	2	6	5
2011	4	4	3	4	4
2012	4	2	2	4	2
2013	1	1	1	1	1
2014	5	5	2	5	5
2015	5	5	3	5	5
2016	2	2	1	2	2
2017				7	7
2018				3	3
2019				1	1
2020				1	1
2021				10	10
<b>Total</b>	<b>109</b>	<b>90</b>	<b>39</b>	<b>413</b>	<b>394</b>

### 3.2.3 Unit of analysis

Unit of analysis of the present research is IPO firms and its rival counter parts belong to the same industry where IPO event take place. Figure 3.1 shows a total of 21 industries taken as unit of analysis for the study.

**Figure 3.1: Industry wise Distribution of IPO Events (1995 to 2019)**

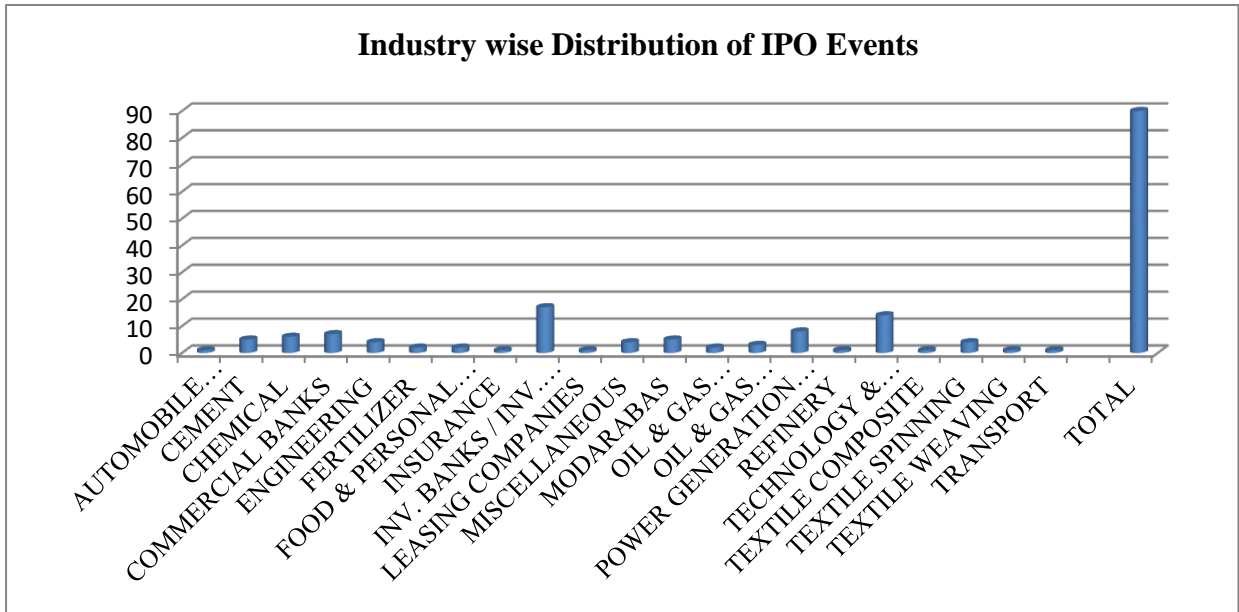
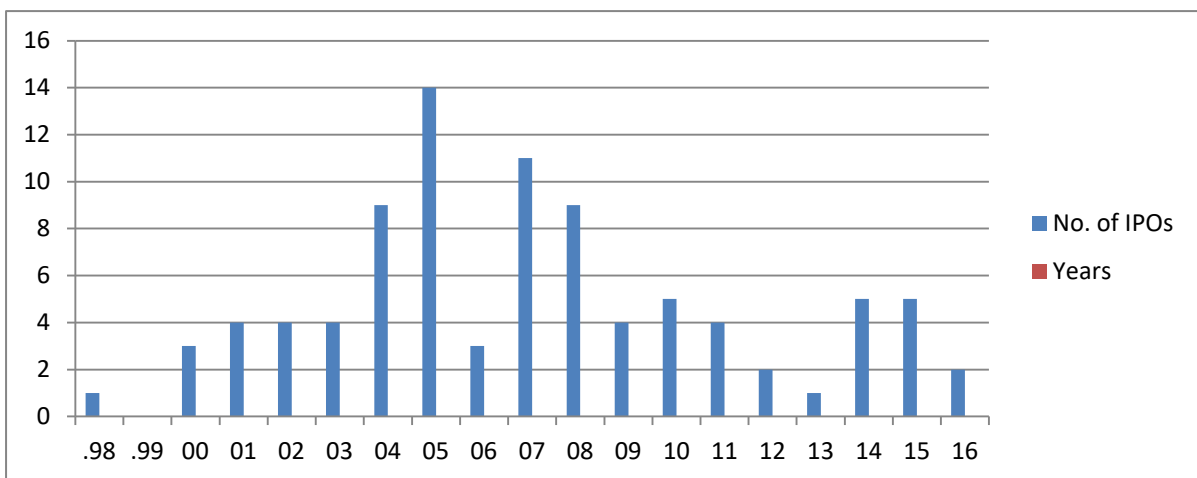


Figure 3.2 shows the year wise distribution of IPOs from 1998 to 2016. During this time year 2004, 2005, 2007 and 2008 were the years with more than 9 IPOs per year. From the rest of the period IPOs are either 5 or less than 5 per years.

**Figure 3.2: Year wise Distribution of IPO Events (1998 to 2016)**



### **3.2.4 Data sources**

Data for IPO firms and their rival portfolios stock returns is mostly available in PSX database. For measuring operating performance, firms Annual Reports and Balance sheet Analysis of State Bank of Pakistan (SBP) have been used. In order to analyze data regarding macroeconomic variables the databases of Business recorder, Securities and Exchange Commission of Pakistan (SECP), IMF and World Bank have been used.

### **3.3 Data analysis techniques in detail**

The present study has two main objectives; to analyze the intra- industry effects and economic implications of IPO firms. For this purpose the study will analyze secondary data available from different data sources and then apply quantitative techniques to attain results.

#### **3.3.1 Impact of IPO on already listed firm's performance**

In order to analyze rival firms performance after IPO, the study will focus on several performance indicators of rival firms like stock returns, profitability, volatility, liquidity and leverage. First of all equally weighted portfolios of rival firms have been made and then by using event window methodology the study will compare the performance of rival firm's portfolios before and after the IPO as used by (Akhigbe et al., 2003, 2006; Hsu et al., 2010; Peller, 2013).

#### **3.3.2 Portfolio Construction**

Previous studies demonstrate that short and long term performance of stock returns are misspecified (Lyon et al., 1999). The reason for this misspecification is adaptation of in appropriate methodologies. In the beginning, previous studies measured the stock performance by comparing event firm with some benchmark like (KSE 100 or S&P 500). In case of IPO event this technique did not work as mostly IPOs do not have historical data which is necessary to find the strength of relationship between event firm and index used as a bench

mark . In order to overcome this problem an IPO event was matched with non- event firm which results in decreasing the level of stock returns between the event and non-event firm to zero. In order to analyze the performance of stock returns portfolios can be constructed on the basis of traditional indices, Fama Franch 3 factor model, and reference and matched firm's portfolios (Mumtaz et al., 2016). Notably, the matched firm's technique is well definite and more concise to observe the normal performance.

Therefore the present study applied matched-firm technique for analyzing the IPO stock returns performance. This method overcomes new listing, rebalancing and skewness biases as suggested by (Barber and Lyon, 1997) and (Mumtaz et al., 2016). The firms matched on the basis of their total assets. Furthermore, a non-IPO firm is selected for matching against an IPO firm. Like Loughran and Ritter (1995) and Mumtaz et al. (2016) for matching the study has taken all firms registered on Pakistan Stock Exchange (PSx) on every December of the year and further made their categories through total assets. The value of matched firm is closed to the event firm. The study ignores such firms which were delisted in last 2 years.

### **3.3.2.1 Criteria for matched firms**

- IPO matched firms taken from the same industry where IPO event occurred.
- Only those industries selected where at least two firms already operating other than IPO firm.
- Firms are matched on the basis of their size which is measured through their Total Assets.
- To verify true matching, t-stat of difference of means used, under the assumption of equal variances.

### 3.3.3 Impact of IPO on rival firms stock returns

After constructing these portfolios first of all the impact of IPO on stock returns of rival's portfolios have been measured. In order to measure stock returns the standard event study methodology of Cumulative Abnormal returns (CAR) for short run as used by (MacKinlay, 1997; Akhigbe et al., 2003; Hsu et al., 2010; Peller, 2013) have been applied. An event window of 14 days before IPO and 14 days after IPO has been created to see how IPO event impact the stock returns of its industry counter parts in short run.

$$CAR = \sum_{i=1}^n AR_{it} \quad (1)$$

For measuring long run stock returns of rival portfolios Buy and Hold Abnormal Returns (BHAR) as used and suggested by Ritter (1991), Barber and Lyons (1997) and Akhigbe et al., (2006). At first we calculate the Buy-and-hold Abnormal Returns (BHAR) for an IPO rival firms by compounding their daily returns starting from 20 days after announcement of IPO for one, two and three years separately. Then the study applied skewness adjusted T-test which states the null hypothesis that mean BHAR is equal to 0 for IPO industry counterparts.

$$BHAR = \frac{1}{n} \sum_{i=1}^n \{ (1+R_{it}) - 1 \} - \{ (1+R_{mt}) - 1 \} \quad (2)$$

In order to measure initial stock returns we apply;

$$R_i = \frac{P_1 - P_0}{P_0} \quad (3)$$

Where  $P_1$  is the price of IPO at the close of 1st day trading,  $P_0$  is price of subscription. In order to calculate market returns we subtract initial returns from market returns.

$$R_m = \frac{I_1 - I_0}{I_0} \quad (4)$$

The market returns are calculated by index difference on the first trading day with previous day.

### 3.3.4 Impact of IPO on rival firms operating performance

Operating performance of rival portfolios in pre and post IPO periods have been measured through Returns on Asset (ROA) as used by (Jain & Kini, 1994; Mikkelsen et al. 1997; Balatbat et al., 2004; Wang, 2005; Hsu et al., 2010). The study also employs Return on Equity (ROE) which indicates the return available to equity holders (Huang and Song, 2005). This ratio is relevant to IPO study in a sense that it covers both aspects of profitability and investors returns. The study will apply matched pairs approach (MNR methodology) by comparing the performance of the rival's IPO 3 years before and 3 years after the event, further applied paired sample t-test to draw a conclusion about the variation in performance. This is widely used by the researchers in previous literatures (Megginson, Nash and Randenborgh, 1994; Huang and Song, 2005; Alanazi Liu, 2013).

$$\text{ROA} = \text{Net Profit Before Tax} / \text{Total Assets} \quad (5)$$

$$\text{ROE} = \text{Net Profit Before Tax} / \text{Shareholder equity} \quad (6)$$

$$\text{Tobin Q} = \text{Market Value of Assets} / \text{Replacement cost of Assets} \quad (7)$$

Alternatively,

$$\text{Tobin Q} = \text{Market Value of Equity \& Liability} / \text{Book Value of Equity \& Liability} \quad (8)$$

Paired sample t-test

$$T = (\bar{x}_{\text{diff}} - 0) / s_x \quad (9)$$

where



$$S_x = S_{\text{diff}} / n \quad (10)$$

$\bar{x}_{\text{diff}}$  = Sample mean of the differences

$n$  = Sample size (i.e., number of observations)

$s_{\text{diff}}$  = Sample standard deviation of the differences

$s_{\bar{x}}$  = Estimated standard error of the mean ( $s/\sqrt{n}$ )

### 3.3.5 Impact of IPO on rival firms leverage

For investigating further the other competitive advantages of IPO firm on its rivals, we will analyze how IPO impact rival firm's leverage which is measured through long-term debt to total assets (Kaplan and Zingales, 1997; Hsu et al., 2010; Chen, Chen and Kao, 2010). Hsu et al (2010) found leverage as one of the potential mechanisms behind poor rival performance. The rival firms with high levels of leverage have poor performance around the introduction of IPO. In order to see impact on IPO event on leverage of rival firms, we run the cross-sectional regression

$$\text{Leverage Ratio} = \text{Total Debt} / \text{Total Equity} \quad (11)$$

Where;

Total Debt: Sum of short and long term obligations

Total Equity: The value of shareholders' equity or net assets.

### 3.3.6 Impact of IPO on rival firms liquidity

For measuring the impact of IPO on liquidity of rival firms, working capital ratios in pre and post IPO event have been applied. This will show how excess returns improve IPO liquidity

position as compare to its rivals. Lefebvre (2022) used liquidity ratio to find the working capital management of IPO firms after the event. Jin, Li, Steven, Zheng and Zhong (2017) found firms with more research and development (R&D) cost, high capital expenditure, lower working capital and high long-term debt, raised more funds through IPOs. To calculate how IPO effect rival firms working capital, the study used current ratio.

$$\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities} \quad (12)$$

Where:

Current Assets: Assets converted into cash or used up within one year.

Current Liabilities: Obligations that due within one year.

### 3.3.7 Impact of IPO on rival stock volatility

For investigating IPO impact of rival's share price volatility the study applies standard deviation to see the variation of Industry rivals share price in Pre and Post IPO settings. The study is taking the daily closing prices of the industry rivals, taking mean of the data, and then find the variation between the data value and the mean which is the actual deviation. Then finally square the deviation to adjust negative values as used by (Narayan, Devpura and Wang 2020; Engelhardt, Krause, Neukirchen and Posch, 2021).

sample mean ( $\bar{x}$ ):

$$\bar{x} = (x_1 + x_2 + \dots + x_n) / n \quad (13)$$

Taking Square differences b/w each data point and the sample mean:

$$\text{Differences} = \{(x_1 - \bar{x})^2, (x_2 - \bar{x})^2, \dots, (x_n - \bar{x})^2\} \quad (14)$$

$$\text{Sum of differences} = \{(x_1 - \bar{x})^2, (x_2 - \bar{x})^2, \dots, (x_n - \bar{x})^2\} \quad (15)$$

Variance of average of square differences:

$$s^2 = \text{sum of differences} / (n - 1) \quad (16)$$

Standard deviation as the square root of the variance:

$$s = \sqrt{(s^2)} \quad (17)$$

### 3.3.8 IPO and Competitive environment

In order to analyze impact of IPO on industry competitive environment, the study will apply Herfindahl-Hirschman index (HHI) as used by (Akhigbe et al., 2006). This index is specially use for measuring market concentration. High level of concentration means low level of competition and market tends towards monopoly. HHI ranges from 0 to 10000, if the sum of squares of market shares of all firms in an industry is less than 1500, than that industry have been consider as competitive. However, high value of HHI indicates high market concentration and high entry barriers for a new firm. Market share of firms have been calculated by dividing individual firm sales with industry sales. In order to gauge the impact of competitive environment on survival of IPO the study incorporate Cox proportional and log logistic model as used by (Peller 2013). The effect of competitive environment is also checked on over or under pricing of IPO by applying standard event study methodology of Cumulative Abnormal returns (CAR) have been used (MacKinlay, 1997; Akhigbe et al., 2003; Hsu et al., 2010; Peller, 2013) have been applied.

$$HHI = S^2_1 + S^2_2 + S^2_3 + \dots + S^2_n \quad (18)$$

where:

$S_n$  = the market share percentage of firm  $n$  expressed range from 0 to 100%.

### 3.3.9 Impact of IPO event on its industry Rival firms

The study applied t-test to finding the individual variation in performance measures of rival firms after the IPO event. However, this is not sufficient and in order to confirm the previous results of uni-variate analysis there is a need to conduct multi-variate regression as well. The study controls various elements of rival firms which are responsible of firm performance.

After controlling such element, we will see the impact of IPO event on rival firms performance.

The econometric equation to run different regressions is;

#### General Equation

$$\text{Rival firms Performance} = \alpha + \beta \text{ IPO indicator}_{it} + \gamma \text{ control variables}_{it} + \varepsilon_{it} \quad (19)$$

#### Empirical Equations

$$\text{ROA}_{it} = \alpha + \beta_{11} \text{IPO D}_{it} + \gamma_{11} Y_{t-1} + \gamma_{12} \text{RFAge}_{it} + \gamma_{13} \text{RFSize}_{it} + \gamma_{14} \text{RFM/B}_{it} + \varepsilon_{it} \quad (20)$$

$$\text{ROE}_{it} = \alpha + \beta_{12} \text{IPO D}_{it} + \gamma_{12} Y_{t-1} + \gamma_{12} \text{RFAge}_{it} + \gamma_{12} \text{RFSize}_{it} + \gamma_{12} \text{RFM/B}_{it} + \varepsilon_{it} \quad (21)$$

$$\text{Liquidity}_{it} = \alpha + \beta_{13} \text{IPO D}_{it} + \gamma_{13} Y_{t-1} + \gamma_{13} \text{RFAge}_{it} + \gamma_{13} \text{RFSize}_{it} + \gamma_{13} \text{RFM/B}_{it} + \varepsilon_{it} \quad \dots\dots(22)$$

$$\text{Leverage}_{it} = \alpha + \beta_{14} \text{IPO D}_{it} + \gamma_{14} Y_{t-1} + \gamma_{14} \text{RFAge}_{it} + \gamma_{14} \text{RFSize}_{it} + \gamma_{14} \text{RFM/B}_{it} + \varepsilon_{it} \quad \dots\dots(23)$$

$$\text{AR}_{it} = \alpha + \beta_{15} \text{IPO D}_{it} + \gamma_{15} Y_{t-1} + \gamma_{15} \text{RFAge}_{it} + \gamma_{15} \text{RFSize}_{it} + \gamma_{15} \text{RFM/B}_{it} + \varepsilon_{it} \quad (24)$$

where,

IPOD: IPO dummy variable.

$Y_{t-i}$ : Lag of Dependent variables

RFAge: Rival firms age from their IPO till observation date.

RFsize: Rival firms size measured through total assets.

RFM/B: Rival firms Market to Book ratio.

Rival firms performance is measured through ROA, ROE, Leverage, Liquidity and Abnormal returns. IPO dummy will be taken as 1, if IPO event takes place in the industry, otherwise it will be taken 0. Lag of all industry performance measures will be taken to control the impact of past performance on current performance of rival firms. Firms size calculated through rival firms total assets. Firm age is the difference between rival firm listed date and observation year. Market to book ratio is calculated through market capitalization of rival firms shares and its book value.

### **3.3.10 IPO's significance for stock market and economy**

To find the relationship between number of IPOs, stock market development and overall economy, the study checks the causal relationship between external factors (both market and economy) and number of IPOs. Before going through regression, the study checks the following assumptions or prerequisites.

#### **3.3.10.1 Test of Stationarity**

In order to check any existence of non – stationarity which results in spurious regression, the study conducts an Augmented Dickey-Fuller (ADF) unit root test. The equation for ADF estimation is as follows:

$$\Delta y_t = \alpha_0 + \alpha_{it} + \beta y_{t-1} + a_i \sum_{i=1}^P \Delta y_{t-i} + \varepsilon_t \quad (25)$$

whereas,  $\Delta y_t$  is the no. of IPOs to be analyzed in longitudinal way,  $\alpha_0$  is the constant,  $t$  is using to capture the time variation,  $\beta$  is the estimated coefficient,  $\varepsilon$  denotes the error term,  $p$  is showing the full lag-length. The test estimates ( $\alpha = 0$ ) the null hypothesis of non-stationary against the alternative hypothesis ( $\alpha \neq 0$ ) of stationary.

### 3.3.10.2 Test of Serial Correlation

Serial or Autocorrelation is the correlation of a variable with its own lagged values. Alternatively, to measure how much similarity exist between two observation at different times. To test autocorrelation, Durbin-Watson test is applied.

$$DW = \frac{\sum_{t=2}^n (\varepsilon_t - \varepsilon_{t-1})^2}{\sum_{t=1}^n \varepsilon_t^2} \quad (26)$$

Where,

$n$  = number of observations

$\varepsilon_t$  = residual for each individual observation.

### 3.3.10.3 Test of Multicollinearity

When two or more explanatory variables are highly correlated then the model contains the problem of multicollinearity. This creates unstable coefficient estimates. To test it the study applied;

$$VIF_i = 1/(1-R_i^2) \quad (27)$$

Where

$VIF_i$  = Variance Inflation Factor for explanatory variable

$R_i^2$  = the R-squared value when the i-th predictor variable is regressed on all other predictor variables in the model.

#### 3.3.10.4 Test of Heteroscedasticity

Heteroscedasticity occurs when residuals have non-constant variance at different levels of the predictor variables. In case of model having heteroscedasticity, it can affect the efficiency and reliability of the coefficient estimates, which results in to biased results. To test it, the study applied Breusch-Pagan test;

$$BP = n \times R^2 \quad (28)$$

Where

n = number of observations.

$R^2$  = Value from the auxiliary regression of squared residuals on the predictor variables.

#### 3.3.10.5 ADRL Model

In order to find the long run relationship between variables different various test can be applied based on the nature of data. Since the data for IPO numbers and external factors is stationary at different level i.e. at level or 1<sup>st</sup> difference, therefore the study is going to apply Auto Regressive Distributive Lag (ARDL) model. Other assumptions or prerequisites before running ARDL are same as mentioned above i.e. absence of autocorrelation, multicollinearity and hetrosackdasticity.

ARDL model cab be written as

$$\text{No\_IPOs}_t = \alpha + \beta_1 \text{No\_IPOs}_{t-1} + \gamma_1 \text{MKT\_Index}_{t-1} + \gamma_2 \text{Trad\_Volume}_{t-1} + \gamma_3 \text{IR}_{t-1} + \gamma_4 \text{FDI}_{t-1} + \gamma_5 \text{GDP\_GR}_{t-1} + \gamma_6 \text{IP}_{t-1} + \delta X_{t-1} + \varepsilon_t \quad (29)$$

Where,

No\_IPOs = Dependent variable (DV)

No\_IPOs<sub>t-1</sub> = The lagged value of the DV with a lag of 1 (autoregressive component).

$\gamma_1$  to  $\gamma_6$  = the coefficients of the lagged first differences of the independent variables.

$\delta$  = the coefficient of any exogenous variable (X) with a lag of 1 (if applicable).

$\varepsilon_t$  = Error Term

### 3.4 Validity and Reliability of Data

The relevant test of validity and reliability of data has been applied before running any test. The study applied paired sample t-test to compare the industry rival firm's performance in the pre and post IPO settings. For this purpose assumption of paired sample t-test has been applied for the accuracy of results. Subjects must be independent. Measurements for one subject do not affect measurements for any other subject. The assumptions of the test are analysis of paired measurement taken from same subject, in our case the same industry rival firms before and after IPO event. Moreover the different measures are distributed normally. The study also removes any outlier before applying t-test. Since our sample size is greater than 30 so no issue of small sample.

To compare share price performance of rival firms before and after IPO event the study applied CAR for short run performance and BHAR for long run performance measure. Again any outlier in data set has been removed in all windows applied in these techniques. Moreover



for BHAR model the sample has also been reduced to 39 IPOs and 217 rival firms as the study excluded all those industries where more than one IPO has been occurred in 3 years' time. In order to run regression analysis the study applied all the assumptions of regression like data stationary and free from hetrosackdasticity, multicollinearity and auto-correlation etc.

### **3.5 Summary of Data analysis techniques**

To measure intra-industry stock returns performance for short and long run event study methodology of Cumulative abnormal Returns (CAR) and Buy and Hold Abnormal Returns (BHARs) applied respectively. To find the impact of IPO on operating performance, liquidity and leverage of already existing firms, 3 years Pre-IPO and 3 years Post-IPO event performance have been captured. Then their means difference has been measured by applying paired sample t-test. Share price volatility of rival firms in pre and post IPO settings has been measured through standard deviation and then applied t-test to see any significant difference occurred or not. Industry competitive environment has been measured through Herfindahl Hirschman Index (HHI). To see the causal relationship between IPO on its industry rival firms a multivariate regression is applied. To see the inter-industry impacts of IPO, one industry has taken as reference dummy and see how much other firms affected through IPO event. In the last an association between IPO and external factors like stock market elements and relevant macroeconomic elements has been test through co-integration followed by regression analysis. To analyze the data, the study used Stata, E-views and MS. Excel. Table 3.2 presents the summary of data analysis techniques.

**Table 3.2 Summary of data analysis techniques**

<b>Independent Variable</b>	<b>Dependent Variable</b>	<b>Description</b>	<b>Analysis Technique</b>	<b>Reference</b>
IPO event	Rival firms	Stock returns in short run	Cumulative Abnormal Returns (CAR)	Hsu et al. (2010)
IPO event	Rival firms	Stock returns in long run	Buy & Hold Abnormal Returns (BAHR)	Akhigbe et al. (2006)
IPO event	Rival firms	Operating performance	ROA, ROE T-test	Huang and Song (2005)
IPO event	Rival firms	Operating performance	Tobin Q T-test	Henry (2023)
IPO event	Rival firms	Share price volatility	Standard Deviation, T-test	Narayan et al. (2020)
IPO event	Rival firms	Leverage	Debt to total assets, T-test	Chen et al. (2010)
IPO event	Rival firms	Liquidity	Working Capital Ratio, T-test	Zheng and Li (2008)
IPO event	Rival firms	Competitive environment	Herfindahl-Hirschman index (HHI), T-test	Akhigbe et al. (2006)
External Factors	No. of IPOs	Association between external factors (Economic & Stock Market) and IPO Numbers.	Auto Regressive Distributive Lags (ARDL)	Cuskun et al. (2017)

## **CHAPTER 4**

### **RESEARCH ANALYSIS AND DISCUSSION**

The analysis section started with descriptive analysis of three main components of the study namely; IPOs, Industry and stock market to see the normality of the data. Then the study conducted correlation analysis to analyze the directional co-movement among the variables. After these two initial steps, the study conducted t-test to analyze the industry performance (both industry wise and as a whole) in terms of operating performance, stock returns (both in short and long run), share price volatility (short run goes to maximum one year period) and industry concentration. Then the study compared the IPO firm performance with its industry counterparts in post IPO event up to 3 years to see which one is better off? Then regression analysis is being done to see the explanatory power of IPO (explanatory variable) with respect to industry (dependent variable) in terms of operating performance, leverage, liquidity and abnormal returns. Then inter-industry comparison has been done to see how industries respond after IPO, means which industries are more affected and which one are less affected through IPOs? In order to address the last hypothesis, the study applied co-integration analysis to see the long run association among IPO numbers, stock market (trading volume and index) and economy (GDP, Interest rate, Industrial production and interest rates).

#### **4.1 Descriptive analysis of rival firms, industry and market returns**

This section started with descriptive statistics of stock returns of rival firms after the IPO event. Table 4.1 presents the descriptive statistics of Industries stock returns for measuring short and long run abnormal returns of rival firms.

**Table 4.1: Descriptive Statistics of IPO rival firms Stock Returns (%)**

Industry Name	Mean	Sd	Min	Max	Skewness	Kurtosis
AUTOMOBILE ASSEMBLER	19.5	3.959	-46.351	79.376	5.804	137.708
CEMENT	14.5	2.598	-16.179	19.936	0.729	9.219
CHEMICAL	18.9	2.466	-17.271	29.597	1.609	21.689
COMMERCIAL BANKS	7.0	2.04	-16.151	27.247	1.278	24.513
ENGINEERING	22.1	3.707	-31.25	66.406	4.355	65.016
FERTILIZER	8.0	2.03	-14.47	34.015	1.521	30.106
FOOD & PERSONAL	23.1	2.782	-41.358	40.401	1.165	39.044
INSURANCE	13.8	2.447	-21.585	49.118	2.526	51.067
INV. BANKS / INV.	25.0	1.703	-4.277	5.19	-0.107	4.514
LEASING COMPANIES	38.3	5.348	-41.304	66.469	2.245	25.762
MISCELLANEOUS	4.0	3.628	-30.687	42.103	1.528	20.024
MODARABAS	35.8	3.075	-27.215	33.333	0.912	13.813
OIL & GAS EXPLORAT	14.0	2.582	-25.256	73.887	5.987	159.214
POWER GENERATION	12.8	2.467	-26.382	24.064	0.673	15.865
REFINERY	11.3	3.028	-24.39	56.8	2.464	46.386
TECHNOLOGY & COMM.	12.6	2.987	-22.581	54.535	2.657	49.439
TEXTILE	38.6	3.189	-27.853	38.126	1.208	20.842
TOBACCO	27.9	5.004	-68.182	123.15	4.559	131.848
TRANSPORT	17.1	3.898	-33.956	53.952	2.892	41.468

Descriptive stats of rival stock returns are given in percentages. They included mean and standard deviations along with their minimum and maximum values, skewness and kurtosis.

Industries like textile, leasing companies and Modarabas offer high returns to their investors.

Industries like engineering, food and personal care, investment banks and tobacco industry offer moderate level of returns. Both minimum and maximum returns showing high values which make skewness values positive most of the time. Moreover, this extreme value clearly

indicates the volatility of stock returns of rival firms during the study period. The reason for this volatility in PSX is due to due to political instability which leads to economic downturn. Moreover, the markets of developing economies normally face the issue of high volatility due to unstable economic conditions, inefficient markets, absence of random walk price adjustments and week regulations. Various Researchers argued that, apart from internal factors, this is a common phenomenon with emerging stock markets especially if they are subject to unsupportive economic environment (Kirui et al., 2014; Tiryaki et al., 2017; Ghani et al., 2022).

#### 4.1.1 Descriptive analysis of IPO firm, Industry and Overall Market

Table 4.2 presents a comparison of returns ranging from IPO to overall market.

**Table 4.2: Descriptive analysis of IPO firm, Industry and Overall Market (%)**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>	<b>Skew.</b>	<b>Kurt.</b>
<b>IPO Returns</b>	8.9	4.835	-100	33.33	4.413	18.17
<b>Ind. Returns</b>	9.5	2.976	-46.35	16.17	3.679	10.64
<b>Market Returns</b>	7.5	1.362	-7.449	8.87	-0.144	6.65

The mean of IPO returns show that on average investor can earn 8.9 % return on daily basis on stocks which can deviate by 4.83 % in either higher or lower end, maximum return that as investors can earn is 33.33 % and maximum loss that may be incurred 100%. Stocks exhibit leptokurtic behavior (Kurt. = 18.76) with positive skewness (Skew. = 4.413). At industry level, investor can earn 9.5 % return from industry with variation of 2.97% on both sides. Maximum benefits can incur is 16.17%, and loss which can occur 46% while the shape of industry returns is highly leptokurtic (10.64) with positive skewness (3.679).Overall market behavior indicates that one can earn 7.5% return on daily basis from Pakistan Stock exchange which can deviate 1.36% for both tails. Maximum benefit that an investor earns from this market is 8.87% while maximum loss that one can suffer is 7.74% during a day. The shape of

the data is again showing leptokurtic where kurtosis and skewness are 6.65 and -0.144 respectively. Overall , it indicates that both IPO 8.9% and market 7.5 % offer the same level of returns to investors which is slightly less than industry returns of 9.5 %.

## 4.2 IPO intra-industry impact on rival stock returns

The first objective of the study is to measure the stock returns of rival firms after the IPO event. These returns are measured in both short run Post event up to 14 days and long run up to 3 years.

### 4.2.1 IPO Intra-industry impacts in short run (CAR) Overall

The first objective of the study is to measure the short term performance of Industry rival portfolios after the happening of IPO event. The performance is measure through Cumulative Abnormal returns (CARs) of industry portfolios.

**Table 4.3: Cumulative Abnormal Returns (CARs) of IPO Rival Firms**

Days	N	CAR	T-test	P-Value
-14 to +14	337	-1.7266***	-16.197	0.000
-13 to +13	337	-1.3534***	-12.696	0.000
-12 to +12	337	-1.0743***	-10.078	0.000
-11 to +11	337	-1.2196***	-11.441	0.000
-10 to +10	337	-0.8394***	-7.875	0.000
-9 to 9	337	-1.2413***	-11.644	0.000
-8 to +8	337	-1.0443***	-9.797	0.000
-6 to +6	337	-0.9835***	-9.227	0.000
-5 to +5	337	-0.5980***	-5.610	0.000
-4 to +4	337	-0.5641***	-5.293	0.000
-3 to +3	337	-0.3055***	-2.866	0.000
-2 to +2	337	-0.2490***	-2.336	0.020
-1 to +1	337	-0.0759	-1.085	0.278

The table shows the occurrence of an IPO event and its impact on industry rivals cumulative abnormal returns (CARs) for different event windows. The sample consists of 337 IPO incumbent firms against 90 IPO events occurred in 19 different industries where industries have at least 2 competing firms for an IPO firm. Abnormal returns are calculated from the difference between actual return of the equally-weighted portfolio of competitors and the expected return, estimated from a one-factor market model. The parameters for the market model are estimated in the period [-252; -15] relative to the event. To test for statistical significance, the T-test applied. \*\*\*/\*\*/\* indicates statistical Significance at the 1%/5%/10% level.

Table 4.3 shows the short run performance of IPO event on its industry rival firms by applying Cumulative Abnormal Returns (CARs) of IPO industry rivals. The estimation window started from 15 days before IPO and goes up to 252 days. The event window with the gap of two days has been documented from day 14 to day 1 before and after IPO event. The study takes 14 days event window for CARs. The reason for taking 14 days event window is if the window is taking for short period than post event window overlapped with some event days. This may create deviation of actual stock returns from their expected values and measuring beta or risk comparing between abnormal and normal performance for short event window may lead to biased estimates. On the other side, for long event window post-event window is still post-event, which may not create problem (Jiang and Leger 2010). Since the data is non-parametric therefore T-test is used to see the difference between pre and post IPO event industry rival performances like (Akhigbe et al., 2003; HSU et al., 2010; Peller, 2013). The results clearly indicates that IPO event exert significant negative impact on its rival firms. The possible reason for these negative returns are investors over optimism towards IPO firms share especially in short run and they shifted their investments from rival firm to IPO firms share. This shows that a developing economy like Pakistan an IPO event create a negative signals for its already existing rival firms.

#### **4.2.2 IPO Intra-industry impacts in Long run (Overall)**

In order to measure the long run performance of IPO rival firms the study adopted Buy and Hold Abnormal Returns (BHAR) methodology. This is one of the mostly applied methodologies to measure performance of IPOs in long run.

**Table 4.4: Buy and Hold Abnormal Returns (BHARs) of Rival Portfolios**

Years	N	Mean	T-Stat	P-Value
12 Months	217	-0.1203*	-1.8274	0.0711
18 Months	217	-0.0842**	-2.0418	0.0442
24Months	217	-0.0958	-1.1772	0.2423
30 Months	217	-0.1012**	-2.0791	0.0406
36 Months	217	0.7814	0.9101	0.3653
1- 36 Months	651	-1.5897*	1.6651	0.0995

The sample consists of 217 IPO rival firms where 39 IPOs events occurred between 1998 and 2016 obtained from PSx. Buy-and-hold Abnormal Returns (BHARs) is calculated for the IPO rival firm by compounding the daily returns of rivals portfolio over the 3-year period following the IPO date. 12 months refers to the year 1 period beginning 20 days after trading. 18months refer to one and half year, started from 366 up to 549 days and +3 so on. 1to36 month is a 3-year period started 20 days after the listing. If the firm is delisted within the 3-year period, the BHAR is computed up to the delisting date. To obtain buy-and-hold abnormal returns of the rival portfolios (BHARs), we subtract the average holding period share return for the industry from the holding period share return for the corresponding IPO rival portfolio. Following Lyon et al. (1999), we compute the skewness-adjusted t-statistic. The t-statistic tests the null hypothesis that the mean buy-and-hold abnormal return equals zero for the sample of IPO firms and rival portfolios.

\*\* Significant at the 5% level.

\*Significant at the 10% level.

Table 4.4 shows the long run performance of IPO event on its rival firms by applying Buy and Hold Abnormal Returns (BHARs). The estimation window started from 20 days after the IPO and goes up to 365 days for 12 Month (year-1), from day 366 to 549 for 18 Months (year- 1.5) and so on. For 1 to 36 Months (1-3 Year) days BHAR started from 20th days till 1095 days. . T-statistics is used to see the significance of IPO event on its rival portfolio in long run like (Akhegibe et al., 2006). The results indicates that IPO event exert significant negative impact on its rival firms up to one year at 10 percent level. Moreover rival portfolios experiences 12 .03% decline in their stock returns in year 1. Similarly a significant negative impact of IPO on its rival’s portfolios has been noted at 1.5 years’ time. Here rivals experience 8.42 % decline in their stock returns. In 2 years’ time frame although returns are continue to decline but insignificant. In 2 and a half year time frame it again shows a significant negative impact of 12.10 % on rival’s portfolios. Overall from year one started from day 20 up to 3 years end at day 1095 the impact is significant at 10 % level and investors of rival firm experience 15.8 % decline if the hold their stock for 3 years. The results of this study are in line with previous studies (Akhegibe et al., 2006: Hsu et al., 2010) where researchers reported a negative price



reaction on rivals portfolios due to IPO. This negative reaction can be explained through both signaling hypothesis which says rivals firms taking a successful IPO as a negative activity for their firm growth. Investors are more incline towards IPO stock in their industry which reduced the demand for rival firms. Nguyen and Sutton (2014) conduct another study where they found stock repurchased strategy before IPO adopted by rival firms in order to save them from negative price reaction after IPO. It can also be explain through supply effect hypothesis which say an inclusion of new asset will decline the value of already existing assets. Since IPOs in Pakistan are mostly firms having no prior trading history and life therefore we can treat them a new firm most of the time.

#### **4.2.3 IPO Intra-industry Operating Performance**

The purpose of this research is to find the intra-industry impact of IPO not only from in terms of the rival portfolios share price but also see how IPO impact their operating performance. For that purpose 4 variables Return on Assets (ROA), Return on Equity (ROE), Leverage and liquidity has been taken. ROA explains how much firms is capable to efficiently utilize its assets. ROE capture return in term of equity holders which also provide some clue on equity holdings of the company. Leverage is explaining the firms financing its assets through debts and remaining have been finance through equity. Liquidity will show the short term solvency of firms and show how easily firm pay off its short term obligations and how sound its working capital management.

#### **4.2.4 Descriptive statistics of performance indicators of Rival firms**

Table 4.5 presents the descriptive statistics of variables used to measure the long run performance of industry counterparts on happening of IPO event.

**Table 4.5: Descriptive Statistics of IPO Industry Competitors (%)**

<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>Sd</b>	<b>Min</b>	<b>Max</b>	<b>Skewness</b>	<b>Kurtosis</b>
<b>ROA</b>	217	7.945	7.536	-12.9	29.2	0.125	2.696
<b>ROE</b>	217	19.938	30.103	-170.3	169	-0.868	15.955
<b>Leverage</b>	217	51.97	25.317	0.45	106.6	-1.011	3.332
<b>Liquidity</b>	217	104.1	54.483	.404	168.4	0.25	1.319

Return on Assets (ROA) shows a mean of 7.94% with variation of 7.53% on average. The maximum Return on Assets (ROA) an industry can earn up to (29.2%) on their assets and then minimum return rather loss on assets goes down to (-12.9%). This means some firms also suffer losses results in negative ROA. The data of ROA is slightly positively skewed (0.125) and Kurtosis (2.696) shows a data has heavier tail than a normal distribution. Return on Equity (ROE) have a mean among industry is 19.93 % with variation of 30 %. Return on Equity (ROE) goes up to 169 % at highest level in some industries and goes down to -170.3 % in some cases which shows losses suffered by firms. The data is moderately skewed with negative skewness of (-0.868) greater than 0.5 and kurtosis show a leptokurtic pattern of distribution with (15.9) greater than 3. Leverage shows a mean of 51.9% which shows of the total assets are 51.9% sponsored by debts. The variation on leverage has been noted up to 25.317 %. At upper limit leverage sometimes cross 100%, means debts are more than the total value of assets in some particular industries. This shows such industries or firms slightly incline towards insolvency. However, its minimum range is 0.45% which means some industries and firms are totally sponsored through equity instead of debt. The data is moderately skewed with negative inclination (-1.011) and kurtosis is slightly above 3 (3.332) which show a data of leverage is leptokurtic. Liquidity ratio shows current assets times current liabilities. The industries show an average of 104.10% of current assets over their current

liabilities with a variation of 54.483 %. Moreover mean liquidity vary from 40.4 % on lower side to 168.4% on higher side. Both skewness ( $0.25 < 0.5$ ) and kurtosis ( $1.319 < 3$ ) are within range. So there is no problem of data normality.

#### 4.2.5 Correlation analysis of performance indicators of Rival firms

Table 4.6 presents the correlation among operating performance like Return on Assets (ROA), Return on Equity (ROE), Leverage and liquidity belong to rivals portfolios.

**Table 4.6: Correlation Analysis**

<b>Variables</b>	<b>N</b>	<b>ROA</b>	<b>ROE</b>	<b>Leverage</b>	<b>Liquidity</b>
<b>ROA</b>	217	1			
<b>ROE</b>	217	0.651	1		
<b>Leverage</b>	217	-0.041	0.074	1	
<b>Liquidity</b>	217	0.304	0.107	0.047	1

The result exhibits a positive correlation between ROA and ROE (0.651), ROA and Liquidity (0.304). Correlation analyses also use to check the level of integration (Karolyi and Stulz, 2002). A relationship is higher than 0.2 indicate that ROA and ROE, ROA and liquidity are partially integrated. However, correlation between ROA and Leverage is negative (-0.041) which shows a least integration between these two variables. While observing the correlation between ROE and Leverage (0.074) and ROE and Liquidity (0.107) the study noticed both are positively associated and least integrated with each other. Similarly correlation between leverage and liquidity (0.047) also show a positive association and least integration between variables. Correlation is also a basic measure among many others to predict multicollinearity among variables. Here it shows that there is no problem of multicollinearity among variables except ROA and ROE which shows a slightly high association.

#### 4.2.6 Operating performance of IPO Rival firms (ROA)

Table 4.7 shows the operating performance of IPOs industry counterparts. While taking a sample for operating performance, the present study applied the same methodology as applied by Hsu et al., (2010). The study considered only those industries where only 1 IPO occurred in last 3 years and taking a sample of 217 IPO rival firms against 39 IPOs only.

**Table 4.7 : Operating performance of IPO Rival firms (ROA)**

Years	N	Pre-IPO Mean	Post-IPO Mean	Mean Difference	T-test	P-Value
1	217	8.605	7.527	-1.078***	-4.757	0.000
2	217	8.102	7.662	-0.440*	-1.919	0.055
3	217	8.257	7.209	-1.048***	-4.381	0.000
1 to 3	651	8.171	7.615	-0.556***	-4.159	0.000

The sample consists of 217 IPO rival firms in the industry where IPO event occurred between 1998 and 2016. Operating performance (ROA) of IPOs rival firms is calculated by measuring Pre and Post IPO event performance of its Industry rivals. Pre and post IPO mean difference is calculated and applied T-test to find any significant difference occurred after IPO.

\*\*\*Significant at the 1% level. \*\* Significant at the 5% level.\*Significant at the 10% level.

Returns on assets (ROA) are calculated through Net profit after tax divided by Total assets of the whole industry portfolio. For every industry portfolio ROA is calculated for 3 years Pre-IPO and 3 years Post-IPO for the same corresponding years as IPO event occurred. Moreover IPO firm ROA subtracted from Industry portfolio ROA for Post-IPO years to see the changed occurred in original portfolio without having IPO firm. By taking their mean first we apply the T-test to see the mean difference between Pre and post IPO event. The results indicated a significant but negative impact of IPO firm on its industry counterparts. This is in line with previous studies (Akhegibe et al., 2006 ). The reason for this negative reaction of rival firms is due to a negative signal which firms derived from occurrence of a successful IPO in their industry. This will not only create a signal of increasing product market competition but also a sign of future decline of their profits due to decrease in their market share and hence decline in

their sales. Additionally it is also support the supply effect which states the inclusion of new asset will decline the performance of existing assets (Braun & Larrain, 2009; Paker & Spiegel, 2020). The results further indicates a “n-Shaped” behavior of rival portfolios which decline drastically in first year but then shown some improvement in second year but again show more decline in third year. The possible explanation for this cyclic movement is, in the first year a new entrant grab the existing market share from rival firms (especially of their same size) result in their poor performance. In the 2<sup>nd</sup> year, the rival firms adopt some preventive measures to improve their performance to some extent. In the 3<sup>rd</sup> year again rival firm’s performance gone down, due to strong competitive affect which still exit in the market. Moreover the results of combined 3 years will also be obtained which shown a significant negative reaction of IPO on rival firms. This achieve the part (a) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of operating performance (ROA).

#### 4.2.7 Operating performance of IPO Rival firms (ROE)

Table 4.8 shows another dimension of operating performance of IPOs industry counterparts that is Return on Equity (ROE). Returns on Equity (ROE) are calculated through Net profit after tax divided by shareholder equity of the whole industry portfolio.

**Table 4.8: Operating performance of IPO Rival firms (ROE)**

Years	N	Pre-IPO Mean	Post-IPO Mean	Mean difference	T-test	P-Value
1	217	21.128	18.134	-2.994***	-13.224	0.000
2	217	18.907	15.025	-3.882***	-16.912	0.000
3	217	30.371	17.358	-13.013***	-54.417	0.000
1 to 3	651	21.809	18.14	-3.669***	-27.459	0.000

The sample consists of 217 IPO rival firms in the industry where IPO event occurred between 1998 and 2016. Operating performance (ROE) of IPOs rival firms is calculated by measuring Pre and Post IPO event performance of its Industry rivals. Pre and post IPO mean difference is calculated and applied T-test to find any significant difference occurred after IPO.

\*\*\*Significant at the 1% level.\*\* Significant at the 5% level.\*Significant at the 10% level.

For every industry portfolio ROE is calculated for 3 years Pre-IPO and 3 years Post-IPO for the same corresponding years as IPO event occurred. Moreover IPO firm ROE is subtracted from Industry portfolio ROE for Post-IPO years to see the changed occurred in original portfolio without having IPO firm. By taking their mean first we apply the T-test to see the mean difference between Pre and post IPO event. Again the results indicated a significant but negative impact of IPO firm on its industry counterparts. This is in line with previous studies (Hsu et al., 2010; Mcgilvery et al., 2012). The reason for this negative reaction of rival firms is due to a negative signal which firms derived from occurrence of a successful IPO in their industry. This will not only create a signal of increasing product market competition but also a sign of future decline of their profits due to decrease in their market share and hence decline in their sales. In addition it also support the supply effect which states the inclusion of new asset will decline the performance of existing assets (Braun and Larrain, 2009). Again a combine effect of 3 year has been documented to see the overall impact of IPO on ROE of rival firms. This overall effect is still negative and significant. This achieve the part (a) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of operating performance (ROE).

#### **4.2.8 Operating performance of IPO Rival firms (Tobin Q)**

In order to measure whether valuation of rival firms stocks is effected through IPO event or not Tobin Q ratio has been applied. Table 4.9 shows the pre and post valuation of IPO industry rival firms. The results indicate that Q ration of rival firms significantly decline after the IPO event in year 1 and year 2. However, in year 3, though it decline but results are insignificant. Overall, when it analyses from year 1 to 3 in a cumulative manner, it again shows a significant decline.

**Table 4.9 Operating performance of IPO Rival firms (Tobin Q)**

Years	N	Pre-IPO Mean	Post-IPO Mean	Mean Difference	T-test	P-Value
1	212	0.95	0.90	-0.05	2.15**	0.04
2	212	0.98	0.92	-0.06	2.55**	0.01
3	212	1.05	0.99	-0.06	1.45	0.15
1 to 3	636	1.08	1.02	0.06	3.15**	0.002

The sample consists of 217 IPO rival firms in the industry where IPO event occurred between 1998 and 2016. Operating performance (Tobin Q) of IPOs rival firms is calculated by measuring Pre and Post IPO event performance of its Industry rivals. Pre and post IPO mean difference is calculated and applied T-test to find any significant difference occurred after IPO.

\*\*\*, \*\*, \* Significant at the 1% , 5% and 10% level respectively.

This indicates rival firms are rival firms are undervalued before IPO event as their Q-ratio is slightly less than 1 (0.95) and (0.98) in year 1 and 2 respectively. After the IPO event this ratio further decline (-0.05) and (-0.06) in first 2 years. The possible reason for this decline is decrease in their share prices after IPO event which ultimately decline the market value of their equity. This decrease is due to investors over valuation to IPO firms share and under valuing rival firms share. The rival firm's performance can be further affected if they belong to competitive industry with low growth prospects. Despite a decline in rival firms Tobin Q after IPO event, the rival firms Tobin Q increase vertically (0.95), (0.98) (1.05) in year 1, 2 and 3 respectively. This increase in year wise rival firm Q ratio, depicts that they earn more than their assets replacement cost. This motivates other firms to enter in to the market like IPO firm and share some of the profit. This would reduce rival firms market share, their share prices which result in low Tobin Q. This further strengthens the argument of declining rival firm share market price and Tobin Q after the IPO event. Moreover the finding are in line with the results of Aghamolla & Thakor( 2022) and Li & Zhang (2021), who argued that decline in rival firms performance is due to competitive effect of IPO.

### 4.3 IPO Intra-industry impact on Liquidity of Rival firms

Table 4.10 presents the liquidity position of rival firms affected through IPO when occurred in their industry.

**Table 4.10: Liquidity of IPO Rival firms**

Years	N	Pre-IPO Mean	Post-IPO Mean	Mean	T-test	P-Value
1	217	53.891	50.479	-3.412***	-14.477	0.000
2	217	53.152	50.552	-2.560***	-10.870	0.000
3	217	58.518	50.247	-8.271***	-33.066	0.000
1 to 3	651	55.025	50.429	-4.596***	-32.985	0.000

The sample consists of 217 IPO rival firms in the industry where IPO event occurred between 1998 and 2016. Short term debt paying capacity of IPOs rival firms is calculated by measuring Pre and Post IPO event performance of its Industry rivals. Pre and post IPO mean difference is calculated and applied T-test to find any significant difference occurred after IPO.

\*\* Significant at the 5% level.

\*Significant at the 10% level.

By applying the same phenomenon of 3 pre IPO years observations and 3 post IPO observations when calculated the values through T-test, the results shows a significant negative impact of IPO on its rivals firms liquidity. Liquidity of firms in an industry is measure through current assets times current liabilities. The results clearly indicate that IPO creates significant negative impact on rival firm's liquidity. It means rival firms experiencing more declines in their current assets with respect to current liabilities. In other words we can say rival firms started taking more loans in short run to fulfill their financing gap, to maintain their market share and ensure their survival. Moreover, the three years pattern of declining liquidity shows a decline in 1<sup>st</sup> year followed by some recovery in 2<sup>nd</sup> year but again drastic decline in third year. This achieve the part (b) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of operating performance (liquidity). The findings are in line with Lefebvre (2022) who documented how IPO firms relaxed in



terms of working capital management after the IPO which results in more aggressive market strategies. This results in increase in more short term debt obligation of rival firms to face the threat of new entrant and maintain their status.

### 4.3.1 IPO Intra-industry on Leverage position of Rival firms

Table 4.11 shows impact of IPO event on leverage of rival firms. By taking 39 IPO events and their 217 rival firms, the leverage is calculated through total liabilities or debt of the firm divided by total assets.

**Table 4.11: Leverage of IPO Rival firms**

Years	N	Pre-IPO Mean	Post-IPO Mean	Mean	T-test	P-Value
1	217	48.005	51.724	3.719***	16.318	0.000
2	217	48.764	56.362	7.598***	32.900	0.000
3	217	53.831	57.754	3.923***	16.404	0.000
1 to 3	651	50.068	55.195	5.127***	38.192	0.000

The sample consists of 217 IPO rival firms in the industry where IPO event occurred between 1998 and 2016. Long term debt paying capacity of IPOs rival firms is calculated by measuring Pre and Post IPO event performance of its Industry rivals. Pre and post IPO mean difference is calculated and applied T-test to find any significant difference occurred after IPO.

\*\*\*Significant at the 1% level.

\*\* Significant at the 5% level.

\*Significant at the 10% level.

Same methodology of taking 3 years Pre-IPO and 3 years Post-IPO observations was adopted.

By taking their mean study apply the T-test to see the mean difference between Pre and post IPO event. The results show a significant but positive impact of IPO event on leverage of it rival portfolios. The results indicate that rival portfolio hesitate to issue new share as they already experiencing decline in their share prices. This results in to relay on leverage or debt to finance firm which ultimately increase their leverage. The results also supported through information effect which states that rival firms as precautionary measure buy back their share on the event of new IPO in their industry (Nguyen and Sutton, 2014; Akhigbe, Madura and Martin, 2014). Moreover, it is also clear that leverage in second year after IPO is higher than

the first and third year which shows an n-shaped curve. This achieve the part (c) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of operating performance (leverage).

### 4.3.2. IPO Intra-industry share price volatility

Share price volatility of rivals portfolios has been measured though pre and post standard deviation measured at industry level and then at market level. Then pre standard deviation of industry has been subtracted from pre standard deviation of market to see any abnormal pattern. Same way has been adopted while calculating the post abnormal pattern. Then compare the pre and post results by applying T-test.

**Table 4.12: IPO Intra-industry Volatility**

Days	Mean difference	Std. Err.	T-test	P-Value
2	0.8575**	0.4082	2.1004	0.0357
5	0.6453***	0.1302	4.9563	0.0000
10	0.5345***	0.1250	4.2756	0.0000
15	0.4550***	0.1250	3.6403	0.0003
20	0.3865***	0.1250	3.0922	0.0020
25	0.3719***	0.1250	2.9752	0.0029
30	0.2917**	0.1250	2.3337	0.0196
182	0.2614**	0.1250	2.0913	0.0365
365	0.2398*	0.1250	1.9189	0.0550

The table shows impact of IPO event on its rival firms share price volatility from day 2 up to 12 months' time. \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.

Table 4.12 presents the overall share price volatility created by IPO event to its industry rival firms in short run up to one year time. The volatility of rival firms share price has been observed in short run up to 1 year timeframe. The study capture the short term impact of IPO event on its industry counterparts share price volatility ranging from day 2 to day 30. It is clearly evident that IPO bring significant positive impact on its industry rival firms in short run. The study also captures how long this behavior persists. The study finds that this volatility

in rival firms portfolio due to occurrence of IPO lasted up to 1 year time. This state of rival portfolios can be explain through investors behavior who are conscious during the time of IPO in buying stock in that particular industry where IPO is going to be conducted. Moreover investors prefer to buy stock of IPO firm which give them abnormal returns in short run. After reaping the benefit of that opportunity they again go back to their previous firm stocks. This behavior of investor creates ups and downs in other firms share prices due to change in demand and supply pattern and ultimately bring volatility. Surprisingly this volatility continuous up to 6 months and then up to 1 year time frame.

### **4.3.3 IPO and Industry Concentration**

In order to calculate the industry concentration we apply Herfindahl Hrsihman index (HHI) which serve a proxy to measure the degree of industry concentration proposed by (Lang and Stulz 1992). In recent years it is also used by (Akhigebi et al., 2006 and Hsu et al., 2010). It stated that rivals belong to concentrated industry (monopolistic one) get advantage from signals of industry progress to a greater extent since these industries contain high entry barriers as compared to competitive industries (perfect competition). Therefore former have more capability of tackling new entrants into the industry. In order to measure industry concentration though Herfindahl index the study apply squared sum of proportions of industry sales by the rival firms. Its maximum value is 10000 means if only 1 firm in an industry with 100% market share. However, its threshold level to divide it into concentrated, moderate and competitive will vary. The range suggested by the U.S. Department of Justice and the Federal Trade Commission and later applied by (Hus et al.,2010) is comparatively low {(0-1000, (1000-1800) and beyond 1800}, from range proposed in HHI {(0-1000),(1000-1500) and beyond 2500)} for three levels . So keep in view this leverage and flexibility we increases the range as {(0-1800), (1800-2800) and beyond 2800 for competitive, moderate and monopolistic.

**Table 4.13: Industry Concentration of Rival Industries (Overall)**

Mean difference	Std. Err.	T-test	P-Value
-102.176***	0.2085	490.052	0.0000

The table shows overall impact of IPO on industry concentration which is measured through Herfindahl Hirschman Index (HHI) \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.

Table 4.13 presents the overall impact of IPO on its industry counterpart's industrial concentration. The figure shows a significant negative impact of IPO on industry concentration of rival portfolios. It means overall IPOs in PSx decreasing industry concentration. The reason for this decrease in industry concentration is quite obvious. In PSx mostly the IPO firms are new entrant in the industry and having no previous history in the market. Therefore IPO means they come to share the existing market share of the industry which ultimately decreases the industry concentration. This can be gone other way round if a big IPO conducted in an industry than it will increase the industry concentration.

#### **4.4 Value Comparison between IPO and Industry Rivals**

This section compares the performance of IPO firms and its rivals firms operating in the same industry. Now it a an established fact that IPO underpriced most of the time and after start of their trading price adjustment take place which results in long run under performance of IPO firms( Akhigebi et al., 2003, 2006: Hsu et al., 2010 ). This decline in IPO firm's performance is twofold; decease in share price as well as decrease in their declining operating performance. Similarly research on IPO intra-industry performance also documented deterioration in rival portfolios stock returns and operating performance after the occurrence of IPO event (Hsu et al., 2010). When both IPO and its rival portfolios shown a decline in their performance than it's a worth doing to see which one is better off? This section make the comparison between IPO firms and its industry rivals in terms of short run performance which is calculated through Cumulative abnormal returns (CARs). For long run we will see the comparison of abnormal

returns between them by applying Buy and Hold Abnormal Returns (BHAR) and operating performance comparison through ROA, ROE, leverage and liquidity comparison.

#### 4.4.1. Operating Performance comparison between IPO firms and Industry Rivals

The study conducts the first performance comparison between IPO and its rival firms in terms of operational efficiency. . As discussed earlier it is evident through various research both IPO and rival firms performance decline after the IPO event. This study provides another insight into IPO research to see which one is better-off between the two.

**Table: 4.14 Comparison between IPO firms and Industry Rivals**

		Year 1	Year 2	Year 3	Overall	% change Year 1-2	% change Year 2-3	% change Year 1-3
<b>IPO Firms</b>	<b>ROA</b>	4.76	6.57	5.12	5.24	38.03	-22.07	7.56
	<b>ROE</b>	10.93	12.79	5.33	9.71	17.02	-58.33	-51.24
	<b>Leverage</b>	55.03	53.68	59.32	55.41	-2.45	10.51	7.8
	<b>Liquidity</b>	119.49	133.99	129.46	130.59	12.13	-3.38	8.34
<b>Industry Rivals</b>	<b>ROA</b>	8.6	7.72	8.35	8.17	-10.23	8.16	-2.91
	<b>ROE</b>	21.13	15.68	31.55	21.81	-25.79	101.21	49.31
	<b>Leverage</b>	62.2	62.62	64.28	63.08	0.68	2.65	3.34
	<b>Liquidity</b>	106.44	105.21	102.03	103.86	-1.16	-3.02	-4.14

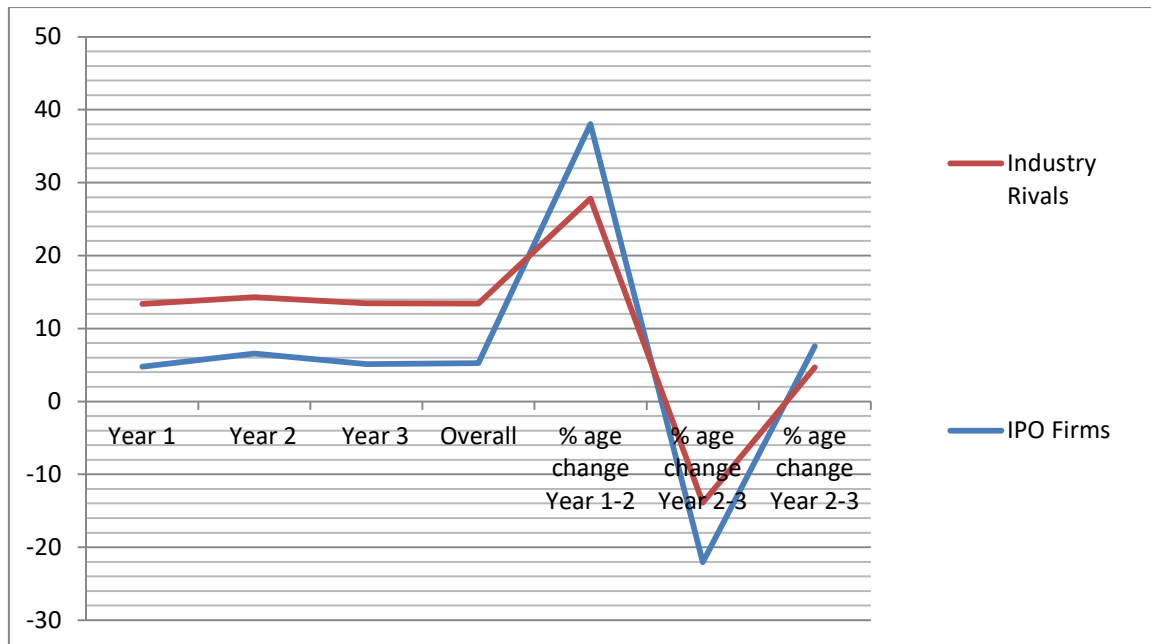
The table shows comparison between IPO firm and its rival firms performance after the IPO event in year 1, 2 , 3 and overall cumulative from year 1 to 3.

Table 4.14 presents the performance comparison in terms of operating efficiency between IPO and its rival firms. The study has made the comparison of operating performance ratio in 3 years after the IPO. If we see the first year performance vertically between IPO and its rivals firms, it is clearly evident that rival has higher ratios of ROA and ROE. Whereas, IPOs outperform their rival firms in terms of leverage and liquidity. Year 2 and 3 also highlighted the same picture where rivals outperform IPO firm in all ratios except leverage and liquidity. The reason for more deteriorating performance of IPO is it's over valuation in terms earnings management if firms exist before IPO. If IPO firm is a new entrant having no past history,

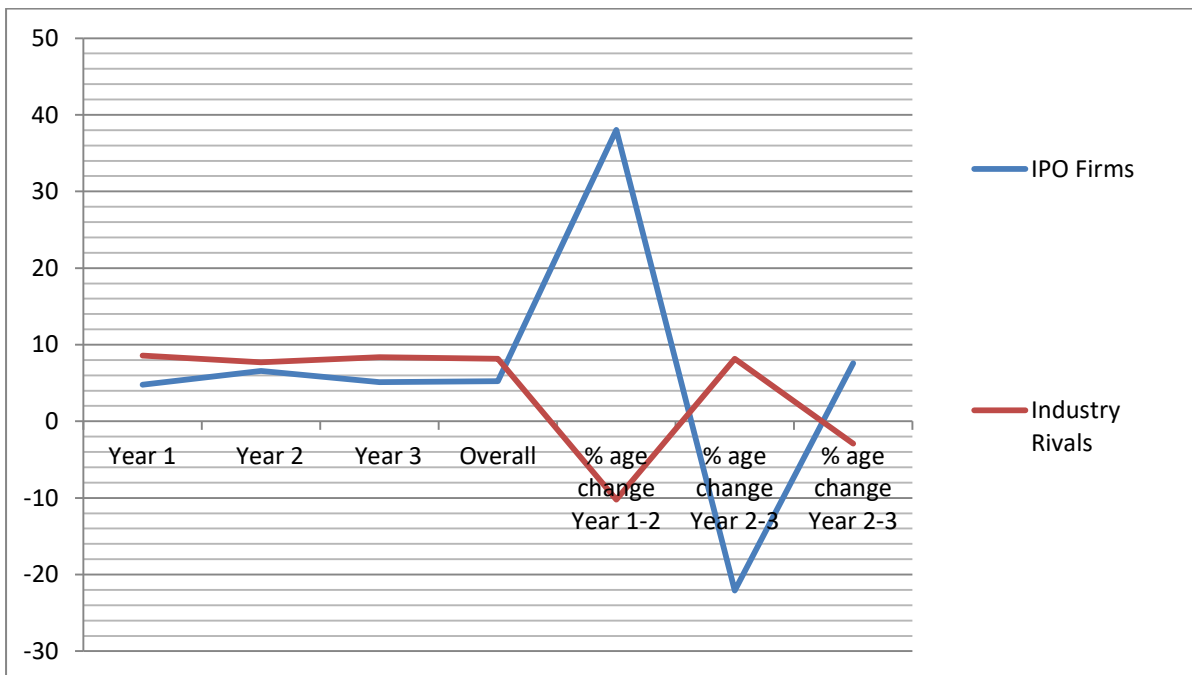
than it depicts inefficiency of its younger management as compared to the rest of the industry. The study conducts another comparison horizontally to see IPO and its rival performance. If we see percentage change from year 1 to year 2, we can see IPO firm perform better in terms of ROA, ROE and Liquidity. There is a considerable rise in ROA, ROE and Liquidity of IPO firms from year 1 to year 2. Rivals firms not only underperform against IPO firms in these ratios but also turned negative. Only a slight improvement shown in its leverage ratio but that is due to difference in financing pattern. IPO firms recently issued share which not only increase their equity but also provide considerable financing cushion. Rivals are not in a position to issue more equity as IPO already affect their prices negatively rather they can go for stock repurchase. In both cases they need extra finance which is available through debt only. Interestingly if we move from year 2 to year 3, the picture become opposite. Now rival firms perform better than IPO firm in all ratios. These mixed horizontal results do not clarify which one is better off. So the study conducts analysis of 1 to 3 year, to see the overall change experienced by the two entities. Year 3 shows IPO perform better in terms of ROA and liquidity, but rival perform better in terms of ROE and leverage. So vertically rivals portfolios perform better than individual IPO firms and horizontally the study provide mixed results. This achieves the 3<sup>rd</sup> hypothesis of the study with mixed results i.e. IPO outperform its industry counterparts in long run in terms of profitability position but under perform in terms of short and long run obligations capacity.

It is established fact from previous studies in IPO that IPO firm performance deteriorate in long run from 1 up to 3 years' time in terms of both stock return and operating performance. The present study concluded that although IPO creates a negative impact on its exiting firms operating in the same industry but still they manage to perform better than IPO firm in both short and long run. The same argument with literature reference has been incorporated in analysis and discussion part (Jain and Kini 1994; Zaluki 2008; Wong 2012).

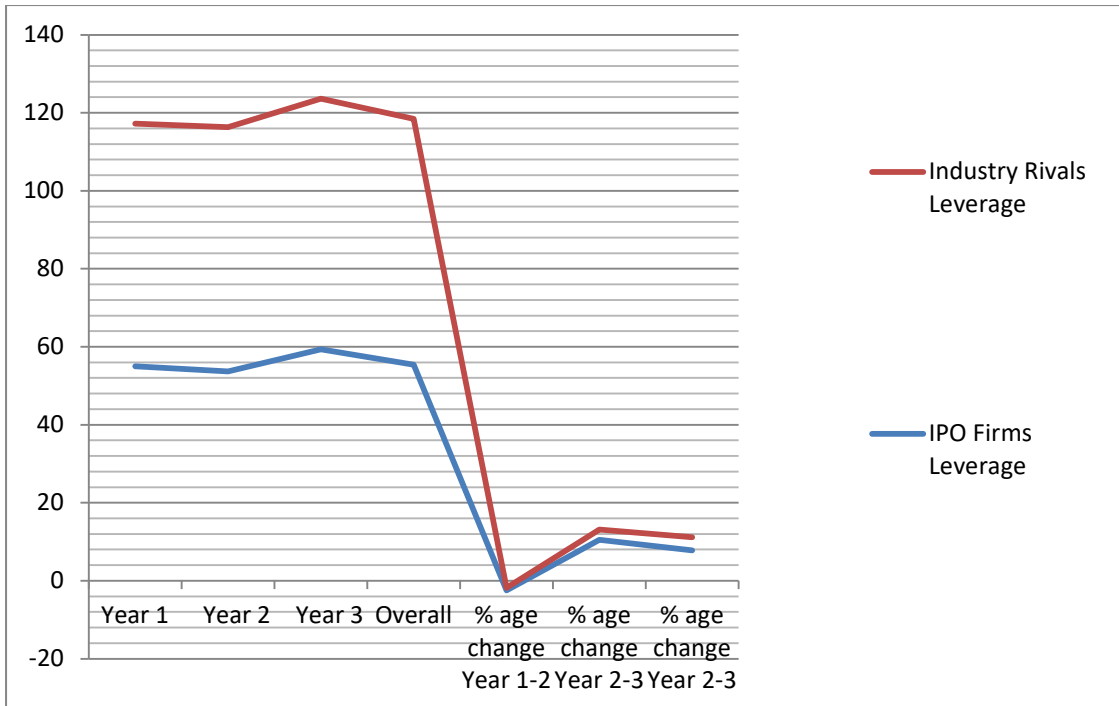
**Figure 4.1: Return on Assets (ROA) Comparison**



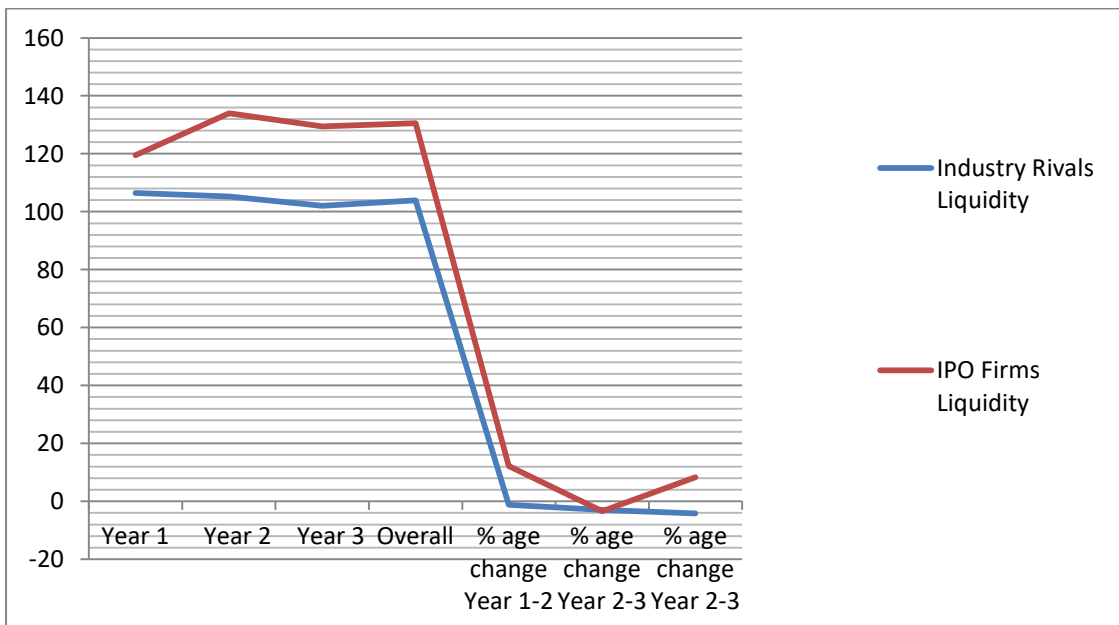
**Figure 4.2: Return on Equity (ROE) Comparison**



**Figure 4.3: Leverage Comparison**



**Figure 4.4: Liquidity Comparison**





## 4.5 IPO Intra-Industry Impact Detailed Industry Analysis

After capturing the overall intra-industry impact, now the detailed industry analysis will be presented to answer forth hypothesis i.e. IPO impacts different industries in a different manner based on their inherent characteristics. Moreover, a particular industry may be treated as special from customer or investors side like technology or financial firms.

### 4.5.1 Industry wise analysis of IPO Intra-industry impacts in short run

The detail analysis of IPO intra industry has been conduct beside see the overall impact in short run as reported in Table 4.15 Industries have been segregated on the same ground as mentioned by Pakistan Stock Exchange (PSx).

**Table 4.15: IPO Intra-industry CARs in short run (Industry Wise)**

Ind name	-14 day	-10 day	-6 day	-2 day	2 day	6 day	10 day	14 day
Cement	0.015 (.03)	-5.69*** (-19.873)	8.266*** (21.83)	1.854** (2.951)	-4.699*** (-4.391)	-5.438*** (-15.455)	-14.777*** (-399.86)	-11.346*** (-24.303)
Chemical	1.375** (2.391)	9.175*** (15.143)	6.496 *** (8.991)		3.182 *** (15.697)		7.194 *** (18.779)	6.065*** (19.774)
Commercial Banks	-0.844 (-1.505)	-1.794** (-2.396)	1.599 *** (6.463)		-9.084*** (-13.006)		-21.146 *** (-67.699)	-23.947 *** (-76.287)
Engineering	-2.15*** (-5.488)		-1.62*** (-4.272)	-5.21*** (-35.727)	-18.74*** (-51.92)	-21.61*** (-57.807)	-32.84*** (-37.974)	-38.19*** (-245.808)
Food & Personal Care Products	-0.492 (-0.817)		19.896 *** (36.514)		17.788*** (299.337)			15.713 *** (21.881)
Miscellaneous	-1.049** (-2.417)	2.08 (1.267)	-4.677*** (-7.446)		-2.112*** (-4.277)	-4.708*** (-10.442)	-8.099*** (-13.125)	-10.963*** (-10.788)
Modarabas	-3.71*** (-7.551)	-13.97*** (-12.446)	-11.61 *** (-34.119)		-14.718*** (-18.143)	-8.329*** (-4.155)	-7.509*** (-14.302)	-13.5*** (-12.122)

Oil & Gas	4.189** (2.372)	9.307*** (10.565)	13.417*** (80.39)	16.34*** (20.39)	21.503*** (24.97)	25.355*** (34.38)	39.054*** (155.6)	34.509*** (77.95)
Power Generation & Distribution	-3.393 (-1.01)	-13.266*** (-38.461)	6.928*** (5.525)	5.371*** (16.132)	0.089 (0.145)	3.235*** (4.229)	-5.516*** (-11.667)	-0.979*** (-0.64)
Technology & Communication	-4.79*** (-4.203)	-7.066*** (-8.096)	-6.308 *** (-14.908)	-17.607*** (-21.463)	0.379 (0.587)	3.72*** (5.852)	2.956 (2.697)	-6.631*** (-18.977)
Textile	-2.748* (-1.907)	-17.051*** (-5.454)	-22.481*** (-38.772)		-24.08*** (-24.594)	-23.513*** (-22.823)	-23.32*** (-18.466)	-13.372*** (-45.612)

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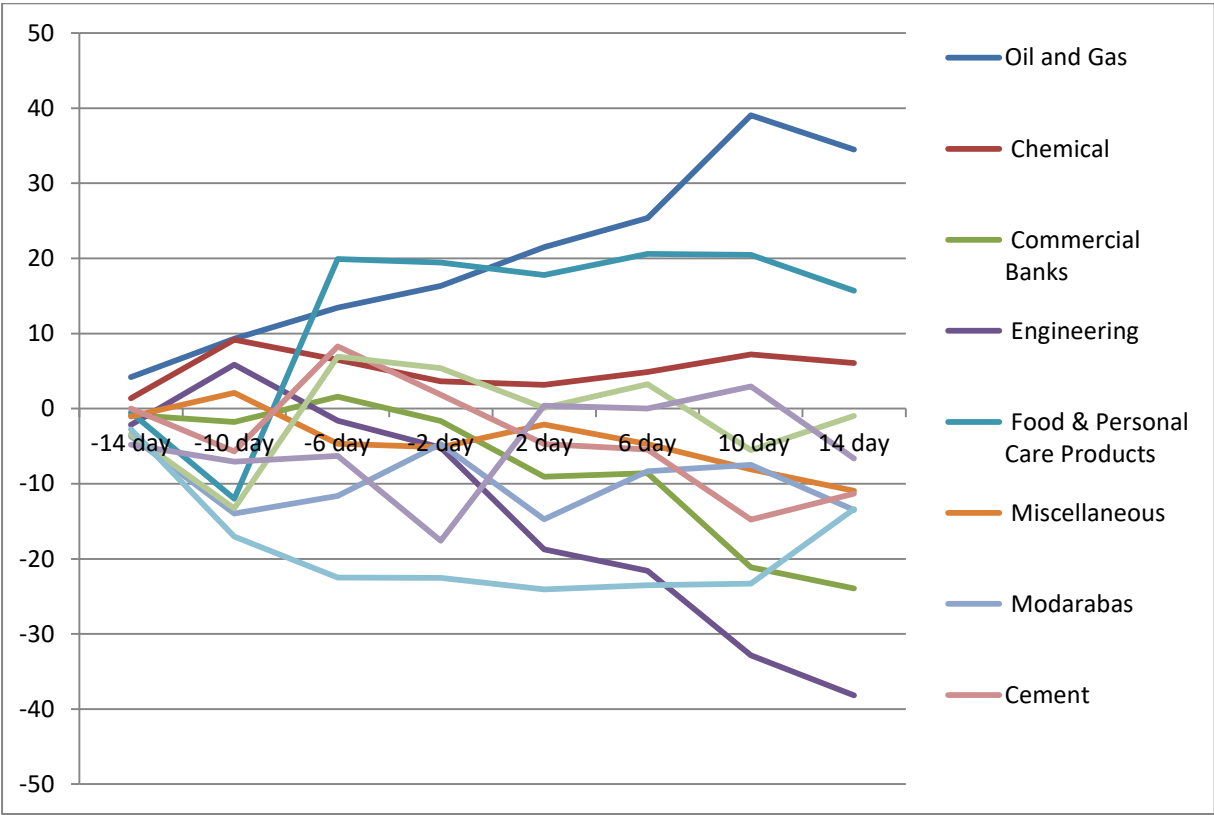
The table shows industry wise impact of IPO (CARS) on its rival firms between -14 to +14 event window. T-stats reported in parenthesis. \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.

Industries like Chemical, Food and personal care, oil and gas and technology and communication shows positive returns for their firms after the IPO event. The shares of these sectors are mostly traded in PSX with high volume. In addition, these sectors belong to products which are the provider of basic necessities in everyday life. Therefore from customer's point of view they are trust worthy sectors where they invest with less risk. This in built customer trust stops them to show over optimism for new entrant as already existing firms with high reputation give them high returns. In addition this behavior also shows better prospects for these industries, therefore the IPO event will be taken as positive as a whole and it improve the performance of overall sector. Unlike above mentioned industries cement, commercial banks, engineering, Miscellaneous, Modarabas and textile shows a decline in firms stock returns after the IPOs. The possible reason for the deterioration in their share price is due to shift of investment from their shares to new entrant share to avail the benefits of

abnormal returns of IPOs. This will result in decline in the stock returns of already working firms in these industries.

The power generation and distribution shows a mixed trend of their share price performance after the IPO event. They show some positive impact immediately after the event up to one week but then it turned negative.

**Figure 4.5: IPO Intra-industry CARs in short run (Industry Wise)**



**4.5.2 Industry wise analysis of IPO Intra-industry impacts in Long run**

Table 4.16 presents the industry wise long run impact of IPO on its rival portfolios. By applying Buy and Hold Abnormal Returns (BHAR) we can see the industry wise performance of rival firms.

**Table 4.16: IPO Intra-industry BHAR in Long run (Industry Wise)**

	Mean	Sd	SE(Mean)	t-stat
<b>CEMENT</b>				
BHARp1	0.139	0.574	0.257	0.541
BHARp2	0.120**	0.124	0.056	2.143
BHARp3	0.476	1.226	0.548	0.869
BHARp1 3	0.933	1.746	0.781	1.195
<b>CHEMICAL</b>				
BHARp1	-0.069	0.149	0.061	-1.131
BHARp2	-0.050	0.448	0.183	-0.272
BHARp3	-0.268**	0.242	0.099	-2.707
BHARp1 3	-0.335*	0.495	0.202	-1.658
<b>COMMERCIAL BANKS</b>				
BHARp1	-0.208	0.523	0.198	-1.051
BHARp2	-0.110	0.377	0.142	-0.775
BHARp3	-0.357**	0.364	0.138	-2.587
BHARp1 3	-0.564**	0.727	0.275	-2.051
<b>ENGINEERING</b>				
BHARp1	-0.257*	0.295	0.147	-1.748
BHARp2	-0.395**	0.371	0.186	-2.124
BHARp3	0.338	0.474	0.274	1.234
BHARp1 3	0.108	0.353	0.204	0.529
<b>FERTILIZER</b>				
BHARp1	-0.042	0.453	0.320	-0.131
BHARp2	0.052	0.477	0.337	0.154
BHARp3	-0.089	0.468	0.331	-0.269
BHARp1 3	0.189	1.587	1.122	0.168
<b>FOOD &amp; PERSONAL CARE PRODUCTS</b>				
BHARp1	-0.318*	0.276	0.195	-1.631
BHARp2	-0.074	0.484	0.342	-0.216
BHARp3	-0.078	0.483	0.341	-0.229
BHARp1 3	-0.629*	0.546	0.386	-1.630
<b>INV. BANKS / INV. COS. / SECURITIES COS</b>				
BHARp1	-0.291**	0.303	0.076	-3.829
BHARp2	-0.101	0.664	0.166	-0.608
BHARp3	-0.147	0.594	0.148	-0.993
BHARp1 3	-0.307	1.326	0.331	-0.927
<b>MISCELLANEOUS</b>				
BHARp1	-0.080	0.388	0.194	-0.412
BHARp2	-0.268	0.688	0.344	-0.779
BHARp3	-0.291	0.624	0.312	-0.933
BHARp1 3	-0.652	1.064	0.532	-1.226
<b>MODARABAS</b>				
BHARp1	-0.217	0.318	0.142	-1.528
BHARp2	-0.213	0.549	0.245	-0.869
BHARp3	-0.348**	0.350	0.157	-2.217
BHARp1 3	-1.071*	1.255	0.561	-1.909
<b>OIL &amp; GAS</b>				
BHARp1	0.384*	0.414	0.239	1.607
BHARp2	0.451***	0.206	0.103	4.379
BHARp3	0.912***	0.321	0.161	5.665
BHARp1 3	1.702*	2.662	1.027	1.657

<b>POWER GENERATION &amp; DISTRIBUTION</b>				
BHARp1	0.117	0.435	0.164	0.713
BHARp2	-0.066	0.195	0.074	-0.892
BHARp3	-0.167*	0.246	0.093	-1.796
BHARp1 3	-0.079	0.716	0.271	-0.292
<b>TECHNOLOGY &amp; COMMUNICATION</b>				
BHARp1	-0.308**	0.452	0.121	-2.545
BHARp2	-0.217**	0.415	0.111	-1.955
BHARp3	-0.058	0.536	0.143	-0.406
BHARp1 3	-0.585*	1.270	0.339	-1.726
<b>TEXTILE</b>				
BHARp1	0.087	0.768	0.384	0.227
BHARp2	0.195	0.905	0.452	0.431
BHARp3	0.589	1.909	0.954	0.617
BHARp1 3	2.640	5.254	2.627	1.005

The table shows industry wise impact of IPO (BHAR) on its rival firms in 1,2 ,3 years separately and then cumulative 1-3 years. \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.

In long run Cement sector shows an unusual behavior of incline in their stock returns after the IPO. The results from year 1 to 3 are mostly insignificant with only year two show some significance but still it is positive. Moreover, the sector is competitive one with (HHI=1034) Index. Chemical sector shows a consistent negative reaction of IPO on their industry although only significant at 3<sup>rd</sup> year and overall 1-3 year. Their partial significance does not depict any pattern, especially when the industry is considered moderate one with (HHI=2170) index. Commercial banks also show the same pattern like chemical sector and show significant negative reaction overall 1-3 and in 3<sup>rd</sup> year only. Although like chemical sector its first two years are also shown a decline in stock prices but insignificant. Moreover it comes under competitive sector with (HHI=1129) index. Engineering sector shows consistent significant negative price reaction in long run after IPO up to 2 years. One reason would be its industry concentration which is not competitive rather moderate (HHI=2321). So an event like IPO can bring significant changes in that particular sector. Fertilizer sector show mostly a negative price reaction of IPO event but insignificant. Moreover, this sector comes under concentrated one and tends towards monopoly with (HHI=3054). Food and personal care shows deterioration in rivals portfolios in 1 year time frame only. It also shows some overall significance on negative side. Again food and personal care sector is less competitive (2802)

and also less traded sector in PSx. Therefore it shows a mixed price reaction both significant and non-significant on completion of successful IPO. Investment banks and securities firms show a negative significant price reaction on 1<sup>st</sup> year only. This sector shows a consistent negative price reaction but insignificant. This sector is highly concentrated one (HHI=5867) and like concentrated industry shows an insignificant reaction . Therefore a small IPO do not affect it drastically and inventor's returns to either their previous investment points or donor show any reaction on IPO. Miscellaneous sector shows a negative price reaction on successful IPO event but insignificant. This sector is comes under competitive one with (HHI=1665) but tend towards moderate. Oil and gas sector has shown a strong association with IPO event. a positive . Oil and gas comes under concentrated industries in terms of industry competitiveness with (HHI=4519). Therefore like all concentrated sectors it shows more price reaction but in positive way. This possible reason for this positive reaction is due to specific industry prospects associated with Oil and gas sector. The ever growing energy demand makes it always lucrative from investor point of view and they expect high returns by holding their shares. Power generation and distribution sector (HHI=3852) shows some significance at 10 % in 3<sup>rd</sup> year otherwise mostly unaffected. Unlike other concentrated industry its shows less association with IPO event. Technology and communication sector show significant negative price reaction on 1<sup>st</sup> , 2<sup>nd</sup> and overall 1-3 years. Like competitive industries it shows more association with IPO event with (HHI =7453) index. Textile sector behave in the different pattern and shows positive but insignificant reaction of IPO event. It has an industry concentration index of 378 which is highly competitive.

Although industry wise we get some clue about how IPO affect industry competitiveness. Firms belong to competitive industry like cement, commercial banks, miscellaneous and textile sector with  $HHI < 1800$  have not shown any significant reaction on happening of IPO. Moreover some time they showed positive signs after IPO. This behavior can be explained through their industry competitiveness. As competitive industries have more number of firms

with perfect competition therefore they cannot be disturbed with an event like IPO until it is a bigger one which can change their existing industry competitiveness. Similarly concentrated industries, like fertilizer, investment banks and power sector having  $HHI > 2400$  also shown an insignificant price reaction This is in line with findings of Akhigbe et al., (2006) who argued that rivals in concentrated industries are capable enough to fend off IPO. However, Oil and gas sector not only show significant but positive reaction of IPO event which is different from other concentrated industries. The reason for this unusual performance of this sector is due to its unique products and services which always in high demand in every economic condition.

When explaining industries at moderate level like, chemical, engineering, food and personal care having  $HHI > 1800 < 2400$ , we have found a mixed pattern and mostly industries shown some moderated association with IPO event. This behavior of long run pricing behavior of industry rival with IPO event is in line with study of Akhigbe et al., (2006) but against the argument of Hsu et al., (2010) who did not find any strong association of IPO event and industry concentration in determining IPO intra industry impacts. However, his study belongs to IPO intra-industry impact in short run. This achieve the part (d) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of performance (Stock returns).

#### **4.5.3. IPO Intra-industry share price volatility (Industry Wise)**

The study further investigates share price volatility industry wise to see which industry is more prone to IPO event. For that purpose the study captures the results of 5, 10, 20 and 30 days for short run and then goes up to 1 year time.

Table 4.17 presents the industry share price volatility created by IPO event to its industry rival firms in short run up to one year time. It is clearly evident that out of 16 sectors 9 sectors shows significant impact of IPO event up to 7 days, however, only 4 sectors that is fertilizer, Oil & gas, Technology & communication and transport shows significance in long run.

**Table 4.17: IPO Intra-industry Volatility (Industry wise)**

<b>Ind. Name</b>	<b>5 day</b>	<b>10 day</b>	<b>20 day</b>	<b>30 day</b>	<b>182 day</b>	<b>365 day</b>
Automobile	1.664* (1.6648)	0.17746 (-1.775)	0.9401 (.9401)	1.5080 (-1.508)	0.0079 (-0.0079)	0.3037 (-0.3037)
Cement	.2247 (.4496)	0.9139** (-2.043)	.02453 (-0.0549)	0.1929 (-0.4315)	0.2841 (0.6354)	0.1489 (0.3331)
Chemical	2.2584*** (3.9117)	1.7211*** (2.9811)	1.3565** (2.3497)	0.9768* (1.692)	0.1005 (-0.1742)	0.1286 (-0.2228)
Commercial Banks	0.2991 (-0.732)	0.0356 (-0.0874)	.00625 (.0153)	0.1982 (-0.4857)	0.0764 (0.1872)	0.0590 (0.1447)
Engineering	1.2606** (2.1836)	1.6114*** (2.7911)	1.0257* (1.7770)	0.4464 (0.7733)	0.7478 (1.2953)	0.6625 (1.1475)
Fertilizer	5.2972*** (7.4915)	3.4175*** (4.833)	1.7623** (2.4923)	2.1537*** (3.458)	2.5871*** (3.658)	2.5143*** (3.5558)
Food & Personal Care Products	0.6056 (-0.856)	0.2429 (0.3436)	0.4557 (.6445)	0.3055 (0.4232)	0.3186 (0.4507)	0.2918 (0.4127)
Insurance	1.6229 (1.623)	0.7165 (0.7165)	.32685 (.326)	0.1254 (0.1255)	0.2392 (-0.2392)	0.3166 (-0.3167)
Inv. Banks	0.5585 (-1.117)	.07381 (-0.1808)	0.1157 (.2836)	0.3372 (0.8261)	0.4662 (1.142)	0.2424 (0.5939)
Leasing Co.	0.4991 (.4990)	0.4902 (0.4903)	0.2742 (.2742)	0.0973 (-0.0907)	0.4501 (-0.4501)	0.5035 (-0.5036)
Modarabas	0.3241 (.5614)	0.4951 (0.9903)	0.5364 (1.0729)	0.3195 (0.6392)	0.52422 (1.0484)	0.7761 (1.5552)
Oil And Gas	.07989** (2.0138)	1.2699** (2.1995)	0.0744** (2.129)	0.2862** (2.4957)	0.4521*** (2.9124)	0.5288 (0.9160)
Power Generation & Distribution	0.6055 (1.354)	0.3142 (0.7026)	0.03127 (0.0699)	0.1045 (0.2338)	0.3933 (-0.8795)	0.2506 (-0.5604)
Technology And Communication	2.0471*** (6.473)	1.4193*** (4.488)	1.1782*** (3.726)	0.5564* (1.759)	0.6067* (1.9188)	0.6688** (2.1149)
Textile	1.346** (-2.333)	0.1476 (0.3990)	0.03684 (-0.0638)	.00539 (.0093)	0.1622 (-0.2810)	0.1124 (-0.1948)
Transport	.0974* (.0974)	3.3282*** (3.328)	2.6084*** (2.6085)	0.6620 (.6621)	2.3308** (2.2201)	1.8887* (1.887)

The table shows industry wise share price volatility after IPO event. T-stats are reported in parenthesis. \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.



Interestingly no industry from financial sector is affected in terms of volatility from IPO event. This industry wise behavior regarding share price volatility of firms shows that only non-financial firms are mostly affected in terms of volatility of their share prices. Moreover within non- financial group those industries are more prone to IPO event where turnover is high and investors are taking more interest particularly if we observe Pakistan Stock Exchange (PSx). This achieve the part (e) of first hypothesis of the study i.e. IPO create a significant negative impact on its industry rivals in terms of performance (share price volatility).

#### 4.5.4. Industry Concentration of Rival Industries (Industry wise)

The study further analyzes the industry concentration one by one while focusing on every industry included in the study.

**Table 4.18: Industry Concentration of Rival Industries (Industry wise)**

Industry Name	HH Index	Industry Conc.	Mean difference	Std. Err.	T-test	P-Value
Cement	1034	Competitive	1350.732***	0.7071	1909.2000	0.0000
Miscellaneous	1665	Competitive	-62.612***	0.7071	-88.5480	0.0000
Modarabas	1671	Competitive	-205.973***	1.0000	-210.0000	0.0000
Textile Spinning	378	Competitive	14.1490***	0.7071	20.0098	0.0000
Fertilizer	3054	Concentrated	370.138***	0.7071	523.4544	0.0000
Inv. Banks / Inv. Cos.	5867	Concentrated	310.099***	1.0000	310.0991	0.0000
Leasing Companies	6266	Concentrated	-99.0478***	1.0000	-99.0479	0.0000
Oil & Gas	3999	Concentrated	-623.911***	0.7071	-880.0000	0.0000
Engineering	2321	Moderate	-184.615***	0.7071	261.0800	0.0000

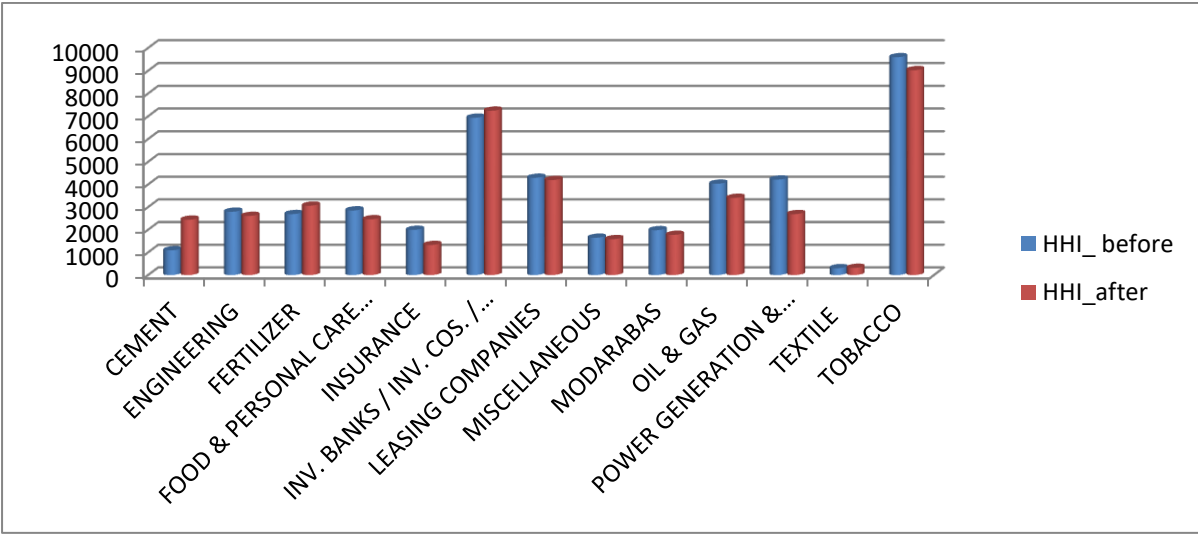
Food & Personal Care Products	2802	Moderate	-390.996***	0.7071	552.9400	0.0000
Insurance	1890	Moderate	-667.156***	1.0000	-670.0000	0.0000

The table shows industry wise impact of IPO on industrial concentration. On the basis HHI (as it goes from low to high) the industries are categories competitive, moderate and monopolistic. \*\*\* indicate significant at the 1% level. \*\* Significant at the 5% level and \*Significant at the 10% level.

Table 4.18 presents the industry wise concentration of those industries where IPO take place. The original sample of consist of 21 relevant industries where IPO event took place during 1995 to 2019 but the sample reduced to 11 industries for calculating industry concentration through HHI, as some industry events were overlapped with each other. Therefore such value and relevant industries are not included in the table. HH Index has been calculated in between the time period of the study that is 1998 till 2016. The mean difference is calculated the difference in Pre-IPO HHI and Post-IPO HHI. Then apply T-statistics to find the significance of IPO event on changes in industry concentration. Cement sector (HHI=1034) shows a competitive concentration show a perfect competition with in industry. A positive mean difference of 1350.73 shown increases in industry concentration from IPO rather decreases. The reason for such increase is the occurrence of big IPOs in cement industry which increase the industry concentration of cement industry. Miscellaneous sector also show a competitiveness that tends to moderate level. IPOs in this sector create significant negative impact on terms of concentration. This is evident that a new entrant will share the market with rivals which results in decrease in industry concentration. Modarabas also behave in the same manner like miscellaneous sector, having HHI=1671 which is near to moderate level. At the same time get significant negative impact of IPO in terms of concentration. Textile sector shows a very low HHI of 378 mean a large number of firms operating in this industry with no one having a huge market share. This makes textile sector more competitive which is also evident from low HHI. The industry shows a positive significant impact on mean concentration before and after IPO. This means a relatively big IPO can bring changes in the industry concentration of highly competitive industries. The next group of industries belong to

concentrated one having HHI values more than 2800. They show a mixed trend where fertilizer (HHI=3054) and investment banking sector (HHI=5867) show a significant but positive impact of IPO on their industry concentration. As explained earlier a big IPO can bring such changes and increase industry concentration. On the other hand leasing sector (HHI=6266) and Oil and gas (HHI=3999) show a significant negative impact of IPO on their industry concentration. These means new entrants are there to share the existing share of the market which results in negative concentration. In our sample for HHI three industries show a moderate concentration level which lies between 1800 and 2800. All 3 industries engineering (HHI=2321), Food and personal care (HHI=2802) and Insurance (HHI=1890) show a significant negative reaction in terms of their industry concentration. This means any new entrant can bring down their concentration level and industry move from moderate to competitive level. This achieve the 2<sup>nd</sup> hypothesis of the study i.e. IPO create a significant negative impact on its industry concentration.

**Figure 4.6: Industry Concentration of Rival Industries (Industry wise)**



#### 4.6 Multivariate Analysis

In this step, the study conducts a multivariate analysis to see the impact of IPO on rival firms operating performance. In order to perform such analysis the study has taken Firm's age, firm size, Ind M/B ratio, lag of DV as control variables. Since these variables are responsible for firm's performance and the present study is more interested to see how IPO impact firms performance, therefore these variables have been taken as control variables. This also solve the problem of endogeneity which has been controlled through control variables and lag of dependent variable.

In order to measure this, the study adopted the following regression equation:

$$\text{Rival Performance}_{it} = \alpha + \beta \text{IPO}_{it} + \gamma \text{RFcontrols}_{it} + \varepsilon_{it} \quad (30)$$

Industry rival firms performance is measured by using Proxy of Operating performance ROA and ROE, Leverage (debt to total assets), Liquidity (current assets to current liabilities) and abnormal return (AR) for each year t and for every firm i. The variable  $\text{IPO}_{it}$  is one in IPO year and zero otherwise for industry. After applying Hausman test, the study applying fixed effects model upon the rejection of null hypothesis, so that the model use a separate constant term for every IPO event occur in industry.

**Table: 4.19 Regression Results of IPO on its Competing firms within Industry**

<b>Dependent Variable</b>	<b>Operating performance</b>	<b>Operating performance</b>	<b>Leverage</b>	<b>Liquidity</b>	<b>Abnormal Returns</b>
<b>Independent Variable</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>IPO Dummy</b>	-0.034*** (-4.53)	-0.031*** (-4.49)	0.107*** (4.39)	-0.036*** (-2.76)	-0.043*** (-2.64)
<b>Lag of Dependent Variable</b>	0.043* (1.64)	0.039* (1.41)	0.197*** (29.13)	-0.024*** (-2.85)	-0.022*** (-3.63)
<b>Log (Age)</b>	-0.087*** (-12.06)	0.087*** (13.06)	0.114*** (8.52)	-0.032*** (-2.90)	0.003 (-0.63)
<b>Log (size)</b>	0.006*** (3.11)	0.006*** (3.01)	0.008*** (2.45)	-0.029*** (-2.44)	0.008*** (5.25)
<b>Industry M/B ratio</b>	0.071*** (4.63)	0.071*** (4.71)	0.237*** (7.04)	-0.017*** (-1.96)	0.022*** (2.41)
<b>Intercept</b>	0.147*** (5.59)	0.132*** (4.59)	0.097*** (2.17)	-0.036*** (-2.47)	-0.072*** (-2.63)
<b>IPO event Fixed Effect</b>	Exist	Exist	Exist	Exist	Exist
<b>N</b>	217	217	217	212	214
<b>R<sup>2</sup></b>	0.031	0.0418	0.0405	0.07	0.07

The table shows the panel regression results IPO event of a firm on its Competing firms within the same industry. The results are shown in terms of operating performance, leverage, liquidity and returns of rival firms explained by the various characteristics of IPO firm along with controlled and dummy variables. The period of 1998 to 2016 was covered during which 90 IPO events were reported. Operating performance, Leverage and Liquidity is the lag difference of current and previous year. Abnormal stock returns are calculated as daily stock returns minus market portfolio returns. IPO dummy variable is one in IPO event year. Log (age) is the difference between competing firms listing and observation year. Log of size is the log of firm's assets in previous years. t-stat is reported in brackets, \*, \*\*, \*\*\* show significance at level 10, 5 and 1 %.

Table 4.19 shows that IPO event exert a significant but negative impact on operating performance of rival firms within the industry. When comparing pre and post IPO event, the results clearly indicates a decline in industry rival performance ROA and ROE by 3.4 and 3.1 % respectively. The possible explanation for such decline in rival firm's performance is due to competitive edge which apparently attain by the IPO through listing itself, financing liberty

due to equity etc. Moreover, some IPOs are conducted by new entrant firms which registered themselves as public limited company from very start. This means a big sizeable firm having a paid up capital of at least \$ 200 Million (listing requirement in PSX) enter in to the industry. This clearly indicates that IPO firm gets the considerable share in product market, grab the market share of already existing firms, which ultimately results in low profitability of the rival firms. This result is more pronounce if the industry having stagnant growth and low future prospects.

Unlike operating performance, leverage ratio of rival firms is increasing significantly that is 10.7% after IPO event which is sign of increase in debt burden for rival firms after IPO event. The increase in leverage is due to firm strategy to be less affected in terms of deteriorating stock returns after IPO event as documented by Nguyen and Sutton (2014). If this repurchase will be done through extra debt to improve debt to equity proportion but at the same time it will results in decrease in rival firms debt to total assets ratio.

The industry competitors also facing decline in their liquidity (working Capital) by 3.6% after occurrence of IPO event. It means rival firms working capital capacity is affect through IPO event. The possible explanation for this decline is due to increase in product market competition and sharing the existing market by newly entered IPO firm. This results in decline in sales of rival firms results in decline in cash and inventory requirements.

The study further analyzes how IPO event impacts the performance of industry rivals in terms of their stock returns. Again a significant decline of 4.3 % has been noted in the in industry rivals stock returns after the occurrence of an IPO event. Since IPO event is considered as important event which in itself contains better prospect for its potential investors in terms of abnormal stock returns. This positive option for potential investors compelled them to shift their investment form existing firms and include IPO firms in their portfolios.

The coefficient of variation determine through R-Sqaure. After controlling various firms elements for profitability, the IPO bring a low level of variation less than 10 % in the models 1 to 5. The possible explanation for low R square is taking only those variables which directly impact the performance of the rival firms. In reality there are many other variables especially at macroeconomic level which are responsible for firm's productivity. Since the aim of study is to see whether IPO event bring any variation in rival firms operating in the same industry which has been achieved through variables applied in the model.

Overall the regression results indicate IPO event have a significantly affect its industry rival firms and their performance decline after IPO event. The results are in line with the work of (Li, Suna and Tian 2018; Elena and Ekaterina, 2018; Ferreras and Robles, 2020); Spiegel and Tookes, 2019; Hou and Li, 2019; Packer and Spiegel, 2020; Aghamolla and Thakor 2020; Billet, Ma and Yu ,2021).

#### **4.7 Inter-Industry impacts of IPO with reference Dummy**

The following section analyzes Industry wise panel data to explain the impact of IPO event on decline in industry level performance. The firm specific Fixed Effect has reported in Table 19 but whether this behavior is persistent through the industries also need to be testified. For that purpose the present study examines industry wise variation between the intercepts. This section discusses the impact of financial intermediation functions on growth levels in different industries.

##### **4.7.1 Inter-Industry impacts of IPO with reference Dummy for Non-Financial Sector**

Table 4.20 taking oil and gas sector as reference dummy for all non- financial industries and reports whether other industries have a significant difference from the respective reference industry.

**Table 4.20: Inter-industry effect with reference Dummy (Non-Financial Firms)**

S. No	Reference	Oil And Gas Industry	
	Dummy	Coefficient	Prob.
1	C	7.0713	0.0000
2	Automobile Industry	-2.3701***	0.0084
3	Cement Industry	-2.5368***	0.0024
4	Chemical Industry	-2.9423***	0.0004
5	Engineering Industry	-2.6357***	0.0038
6	Fertilizer	- 3.4532***	0.0208
7	Food & Personal Care	-3.1533***	0.0021
8	<b>Oil And Gas Industry</b>	---	---
9	Power Generation & Distribution Industry	-4.2432***	0.0001
10	Tech. & Communication	-3.378***	0.0008
11	Textile Industry	-3.492***	0.0001
12	Transport	-2.0266***	0.0134
13	Operating performance (ROA)	-0.2614***	0.0000
14	Operating performance (ROE)	-0.0207*	0.0968
15	Leverage	0.2039***	0.0000
16	Liquidity	-0.0346	0.8843
17	Abnormal Returns	-0.0471**	0.0430
	Adjusted R-Squared	0.2840	
	F-Statistic	338.4930	
	Prob (F-Statistic)	0.0000	

The table shows inter-industry comparison of industry keeping in view impact of IPO event. Taking industries in bold as reference industry the study comparing impact of IPO event impact of reference industries and other industries to see which one is more affected. Positive Beta sign show industry is more affected from IPO event as compared to reference industry. , \*\*,\*\*\* show significance at level 10,5 and 1 % respectively.

Taking Oil and Gas Industry as a reference industry, Table 4.20 shows that Automobile, Cement, Chemical, Engineering, Fertilizer, Food & Personal Care Products, Power Generation



& Distribution, Technology and Communication, Textile and Transport Industry have shown a significant negative impact of IPO event. The Coefficient (Beta) value of Automobile Industry is -2.3701. Similarly Cement Industry -2.5368, Chemical Industry -2.9423, Engineering Industry -2.6357, Fertilizer Industry -3.4532, Food & Personal Care Products Industry -3.1533, Power Generation & Distribution Industry -4.2432, Technology and Communication-3.378, Textile Industry -3.492, Transport Industry -2.0266 shown their significant but negative betas.

Overall when the study taking Oil and Gas industry as a reference Industry, all other industries included in sample has shown an impact of IPO which is lesser than the Oil and Gas industry. The overall results indicate that IPO event is more effective to Oil and Gas industry as compared to rest of the sectors. After Oil and Gas industry Transport Industry is the second most affected industry due to IPO event. Automobile, cement, engineering, chemical, food and personal care and fertilizer come after oil and gas and transport sectors. Whereas, Power Generation & Distribution shows the lowest association with IPO event.

The industry wise variables of ROA, ROE, Liquidity and Stock returns shown considerable decline after the occurrence of IPO in their industry. Whereas, the industry leverage is showing an increasing pattern after the happening of an IPO. This clearly indicates a decline in overall performance of IPO rivals after occurrence of an IPO event in their Industry.

#### **4.7.2 Inter-Industry impacts of IPO with reference Dummy for Financial Sector**

In Table 4.21 Insurance sector has been taken as reference dummy for financial industries. The table reports whether other industries have a significant difference from the respective reference industry.

**Table 4.21: Inter-industry effect with reference Dummy (Financial Firms)**

S. No	Reference Dummy	Insurance Coefficient	Prob.
1	C	4.7004	-0.0008
2	<b>Insurance</b>	---	---
3	Commercial Banks	0.7583***	0.0007
4	Leasing Co.	-1.7674*	0.0924
5	Modarabas	-4.6299***	0.0007
6	Investment Co.	-2.4103***	0.0007
7	Operating performance (ROA)	-0.2614***	0.0000
8	Operating performance (ROE)	-0.0207	0.0968
9	Leverage	0.2039***	0.0000
10	Liquidity	-0.0346	0.8843
11	Abnormal Returns	-0.0471**	0.0430
	Adjusted R-Squared	0.2456	
	F-Statistic	313.793	
	Prob (F-Statistic)	0.0000	

The table shows inter-industry comparison of industry keeping in view impact of IPO event. Taking industries in bold as reference industry the study comparing impact of IPO event impact of reference industries and other industries to see which one is more affected. Positive Beta sign show industry is more affected from IPO event as compared to reference industry. , \*\*,\*\*\* show significance at level 10,5 and 1 % respectively.

Taking Insurance as a reference industry, Table 4.21 shows Commercial Banks, Leasing Co. Modarabas and investment companies all have significantly different impacts of IPOs as compare to the Insurance sector.

Commercial Banks shown a coefficient value (Beta) of 0.7583 which is greater than the reference industry that is insurance sector whereas leasing Companies, Modarabas and Investment firms are showing their coefficient values -1.7674, -4.6299 and -2.4103 respectively which are lesser than Insurance Industry.

Overall Commercial bank dominates the rest of financial sector in terms of IPO effects. On reason for such dominance by commercial banks is their more active role in the society and everyday life and their more visibility as compared to other financial institutions. Therefore the overall industry environment in commercial banking sector is more active which results in more active participation in any such event like IPO.

The results further elaborate that industry competitor's leverage is the only variable which is showing some increase whereas the rest of the elements like Return on Asset (ROA), Returns on Equity (ROE), Liquidity and abnormal returns (ARs) are showing a negative association with IPO event. The positive association of IPO event and Industry competitors' leverage indicates that IPO rivals leverage requirements increase after IPO event. Since the IPO firm gone through IPO event so its equity requirements are somewhat balanced due to this event results in better debt to equity and debt to asset ratio as compared to their rival firms. Whereas the rest of the elements shown a negative association which is in line with study of (Hus et al, 2010).

#### **4.8: Economic Consequences of IPO**

Now the study will examine if any relationship exist between external factors (stock market and macro-economic variables) and number of IPOs. For that purpose the study applies various econometric techniques to explore and analyze the relationship between economic variables and number of IPOs.

#### 4.8.1 Descriptive Statistics of External Factors and IPO Numbers

Table 4.22 shows the descriptive statistics of External factors and their impact on IPO numbers.

**Table 4.22 Descriptive Statistics of External Factors and IPO Numbers**

	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
N-IPO	0.00	86.00	14.40	22.996	2.08	6.05
Psx-Index	945.24	47806.96	15413.83	16233.21	0.83	2.11
Tra_vol	6.74	689.32	139.51	155.48	2.43	8.62
IR	5.50	20.00	11.62	3.71	0.40	2.46
FDI	310.00	5590.00	1660.83	1392.07	1.50	4.86
GDP	-1.27	7.70	4.02	2.08	-0.21	2.95
IP	7540.00	41485.00	20986.36	12347.69	0.33	1.54

The mean of IPO numbers show that on average 14 to 15 IPOs were conducted from 1992 to 2019. This shows a reasonable number of IPOs every years for the study period but the situation change from decade to decade. From year 1990 to 2000, the average IPO per year was 32, from 2001 to 2010 it declined to 8 IPOs per year and from 2011 to 2021 the average further declined to 4 IPOs per year. PSX Index shows the values from 48000 point high level to 945 point low level, which shows a great improvement in PSX performance in 3 decades. Similarly there is a considerable improvement in trading volume of shares during the time span of the study.

The variation in interest rates though spread over 3 decades but event then it's not good as it range from 5.5 % to 20 %. The variation in cost of debts can affect the demand for equity issue with huge variation which is again a sign of instability. Foreign Direct Investment (FDI) and industrial production also improve during the study period but not at desirable pace. Gross Domestic Product (GDP) growth rates shows a huge variation and its negative value shows a serious concern about Pakistan's economy. There are lots of internal factors like securities (Law & Order) issue, energy crises, political and economic instability. Similarly

external COVID 19 and economic recession of 2007 and 2008 also hit the world economies badly.

Since the data is time variant therefore the value of standard deviation, skewness and kurtosis are beyond the acceptable limit but this is normal with this type of data.

#### 4.8.2 Correlation analysis of External Factors and IPO Numbers

Table 4.23 shows a correlation among variables used to analyze external factors impact on IPO numbers.

**Table 4.23 Correlation of External Factors and IPO Numbers**

Variables	1	2	3	4	5	6	7
(1) N-IPO	1						
(2) PSX-Ind	-0.372	1					
(3) Tra_vol	0.298	0.061	1				
(4) IR	0.517*	-0.612*	-0.466*	1			
(5) FDI	0.276*	0.327	-0.03	-0.342	1		
(6) GDP	0.288*	0.044	0.104	-0.432*	0.039	1	
(7) IP	-0.44	0.921*	-0.017	-0.561*	0.428*	-0.004	1

Shows significance at \*\*\*, \*\*, \* 1, 5, 10 % level respectively.

A significant positive association has been noted among N-IPOs and Interest Rate (IR), Foreign Direct Investment (FDI) Gross Domestic Product (GDP). It means improvement in these economic indicators results in improvement in IPO activity within the economy. Whereas for the rest of variables like; PSX index, trading volume and industrial production it remains insignificant. This means stock market variables and IP do not impact IPO activity with in Pakistan's context.

In addition, interest rate shows a positive but negative association with stock market index and trading volume. This means when the cost of debt is high the investors move towards equity. Moreover, increase in interest rate means increase in discount rate which decreases the present value future cash flows which is quite logical. Similarly GDP shows a significant negative

relationship with interest rate which is again understandable. With very high interest rates the pace of economy is slow and vice versa. Industrial production (IP) shows a significant positive association with stock market index and GDP growth rate but negative relationship with interest rate. This is again quite logical. Growth in industrial production can build investors' confidence which lead to positive activity in the secondary market. Similarly, increase in industrial production leads to overall growth of the economy which is depicted through improvement in GDP growth rate. However, increase in interest rates slow the lending activity which affects the industrial production.

### 4.8.3 Unit root test

Augmented Dickey Fuller (ADF) test has been applied to check the order of integration among the data.

**TABLE 4.24: Unit Root Analysis**

Variables	ADF- level	ADF-1 <sup>st</sup> differences
IPO_n	-3.26[3]	-15.48[2]***
Tra_vol	-4.82[0]***	
Psx-Index	-2.28[0]	-13.69[0]***
GDP	-2.08[1]	-19.02[0]***
IR	-2.51[2]	-11.13[0]***
IP	-2.20[2]	-10.13[0]***
FDI	-2.02[2]	-19.13[0]***

\*, \*\*, \*\*\* shows significance at 10% , 5%, and 1%

The study applies Augmented Dickey-Fuller-ADF to check the unit root for each variable. Table 4.24 shows that presence of unit roots in all variables except Stock market trading volume which is then adjusted at first difference. Since variables are stationery at different levels, then ARDL approach can be applied.

#### 4.8.4 Diagnostic Tests

In order to see the normality of data test of serial correlation, normality, functional forms and hetrosackdasticity has been performed.

**TABLE 4.25: Diagnostic Test**

Item	Test Applied	CHSQ(2)	Probability
Serial Correlation	Lagrange multiplier test	0.96190	0.327
Functional Form	Ramsey's RESET test	0.58	0.432
Normality	Skewness and kurtosis of residuals	2.78	0.228
Heteroscedasticity	Regression of squared residuals on squared fitted	2.38	0.123

Lagrange multiplier test of residual serial correlation Based on a test of skewness and kurtosis of residuals Ramsey's RESET test using the square of the fitted values Based on the regression of squared residuals on squared fitted

Table 4.25 shows the result of diagnostic test to analyze the data. The results of all the test show insignificant results which means data is normal and free from problems like serial correlation, functional forms, skewness and kurtosis and heteroskedasticity.

#### 4.8.5 Long Run Coefficients Estimation using ARDL

In order to see the long run association among the variable ARDL test applied. Table 4.26 shows that Interest rates (IR), Foreign Direct Investment (FDI) and GDP growth rate have some significance with Number of IPOs in Pakistan.

**TABLE 4.26: Long Run Coefficients Estimation using ARDL**

<b>Regressor</b>	<b>Coefficient</b>	<b>Standard Error</b>	<b>T-Ratio</b>	<b>Probability</b>
Psx-Index	-0.851	0.562	-1.515	0.152
Tra_vol	0.028	0.022	1.280	0.211
IR	3.120*	1.795	1.739	0.093
FDI	0.296*	0.158	1.871	0.071
GDP	5.789**	2.143	2.702	0.017
IP	-0.006	0.010	-0.564	0.583

Displays the long term coefficients under ARDL \* , \*\* , \*\*\* shows significance at 10% , 5% , and 1%

The rationale behind IR positive impact on IPO number is when there is an increase in Interest rate, the cost of debt increase and firms can avail equity option to finance themselves. Similarly FDI brings more liquidity in the economy, if it is visible enough then firms get the benefit of this influx and offer their equity to generate more funds. In the same manner, increase in GDP growth rate is the sign of economic growth; therefore in order to fulfill growing economic needs of firms IPOs can be conducted.

#### **4.8.6 Error Correction Estimation using ARDL**

Table 4.27 shows the short run error correction results of previously reported long run relationships of external variables with IPO numbers. Based on ARDL, the results show Interest rate, GDP and FDI shows a positive and significant on IPO numbers. Whereas the rest of the variables like Industrial production and stock market variable gain show no relationship with IPO numbers. It means that although the Industrial production is a sign of flourishing economy but it only represent a special segment of economy that is manufacturing sector, whereas IPOs are conducted in every sector that is way it may not capture its impact on IPO numbers. Stock market variables like market index and market volume which measures the



performance of any stock exchange are not creating any motivation for firms to conduct their IPOs.

**TABLE 4.27: Error Correction Estimation using ARDL**

Regressor	Coefficient	Standard Error	T-Ratio	Probability
$\Delta$ Psx-Index	-0.005	0.008	-0.613	0.552
$\Delta$ Tra_vol	-0.288	0.369	-0.780	0.450
$\Delta$ IR	0.220**	0.090	2.434**	0.022
$\Delta$ FDI	0.310**	0.148	2.099**	0.045
$\Delta$ GDP	0.083*	0.048	1.744*	0.092
$\Delta$ IP	0.006	0.010	0.564	0.580
ECM(-1)	-0.6099	0.17104	-3.5662	0.002
Adj R2	0.467			
F-Stat	6.333			
F-Sig	0.001			
D.W.	2.023			

Displays the short term coefficients under ARDL \* , \*\* , \*\*\* shows significance at 10% , 5%, and 1%

$$ECM = N\_IPO -0.005 (Psx-Index) - 0.288(Tra\_vol) + 0.220 (IR) + 0.310 (FDI) + 0.083 (GDP) + 0.006 (IP) \quad (31)$$

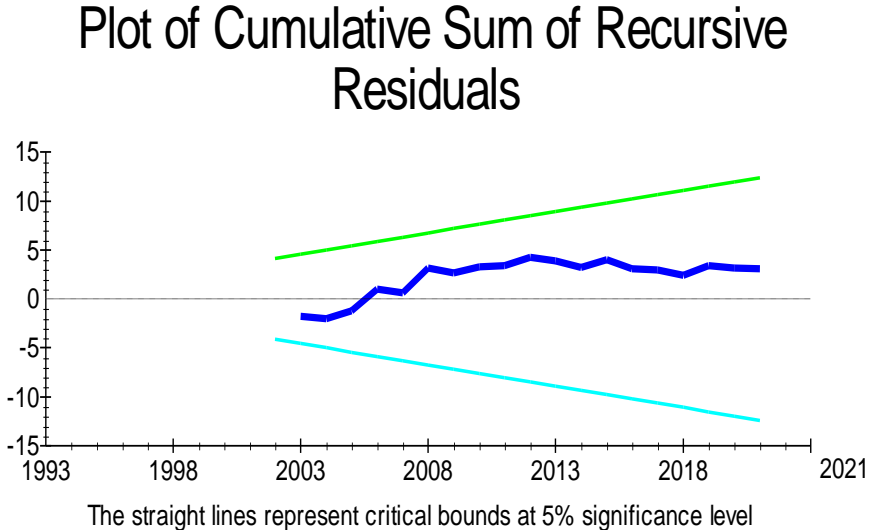
Moreover, equation (4.8.6.1) shows the significant values of IR, FDI and GDP growth rate are 0.22, 0.310 and 0.083 which are lesser than long run estimates which were 3.12, 0.296 and 5.789 except FDI which has slightly greater value in short run. The value of ECM (-1) is significant and negative with value of 60%. It means that disequilibrium in IPO numbers (in short run) from its equilibrium path has been adjusted (in long run) at the rate of 60 percent which is quite fast.

#### 4.8.7 CUSUM and CUSUMSQ

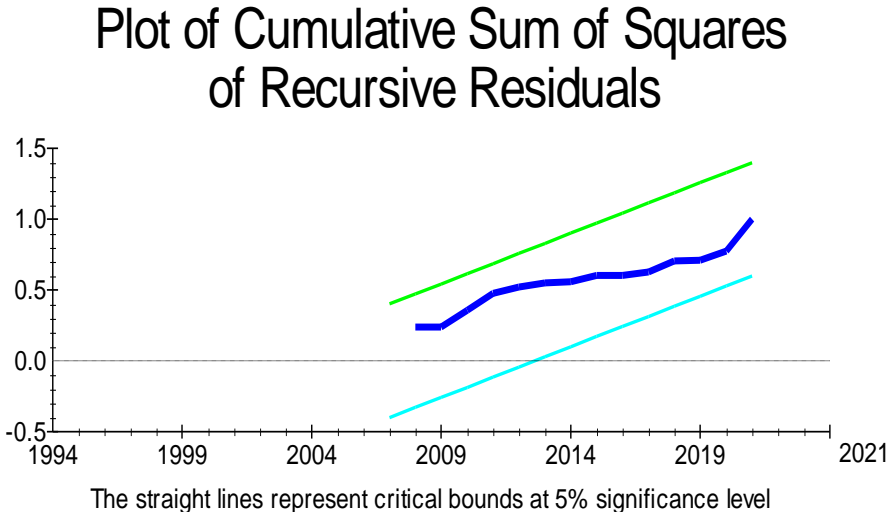
Figure 4.7 shows Cumulative Sum of Recursive Residuals (CUSUM) with in critical bound of 5% which is the indication of structural stability of Model. Similarly, Figure 4.8 shows

Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) which again shows structural stability of Model as the values lies between critical bound of 5%.

**Figure 4.7: Cumulative Sum of Recursive Residuals (CUSUM)**



**Figure 4.8: Cumulative Sum of Squares of Recursive Resid. (CUSUMSQ)**



## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATIONS**

The chapter starts with the purpose of the study and see to what extent the study achieve the objectives through analysis and results. Then the findings of the study will be compared with previous researches and see the present work endorse the previous literature or provide contradictory results. Then the implication of the study in terms of theoretical, practical and policy contribution will be discussed. In last, it also suggests the future research directions along with present study research limitation.

In order to find intra-industry and economic consequences of IPO the study has been divided in to two parts. In the first part IPO intra and inter industry impacts has been observed by applying different analysis techniques. In the second part the study find the relationship that exists between IPO activity and external factors (both stock market and macroeconomic) prevailing in Pakistani environment.

In order to see the Intra-Industry impacts of IPO on its competing firms, the study has analyzed various performance impacts which can be drawn by an IPO event on its rival counterparts. In order to measure the short run abnormal returns of rival firms after the IPO event, the study applied Cumulative Abnormal Returns (CARs). The CARs results clearly indicate a significant deterioration in rival's stock returns in 14 days window. Taking industry wise analysis of CARs the study finds Chemical, Food & personal care, Oil & gas and Technology & Communication have been shown an upward trend in their stock returns in Post IPO settings while the rest of the industries shown a downward trend. The reason for upward trend is IPO event depicts positive signals for the whole industry, if industry has a better growth prospects, results in overall better performance of the whole industry. In case of low

growth industries, IPO firms depicts a signals of high quality which makes investor's over optimist about IPO firms share which results in less demand for rival firm's stock. While examining long run stock returns performance the study applied event study methodology of Buy and Hold Abnormal Returns (BAHRs). The results indicate a significant negative impact of IPO event on its rival stock returns in long run in 12, 18 and 30 months. Whereas, results in 24 and 36 months' time frame an insignificant impact has been noted by the study. The reason for insignificant impact of IPO event on rival firms is due to correction in investor's over optimism in long run. Furthermore, long run analysis also conducted industry wise to see which industry is more or less affected through IPO event. It has been noted that only Oil & gas sector has a significant and positive impact of IPO event in long run. So investors can retain the shares of existing firms in Oil & gas sector event after the IPO event.

In order to see the impact of IPO event on operating performance of rival portfolios, T-test has been applied to see is there any significant change occurred in industries portfolios after the IPO event? The results indicated that operating performance (both ROA & ROE) of rival portfolios declined in 1 to 3 years' time with some recovery has been occurred in 2<sup>nd</sup> year. Similarly short term liquidity (working capital requirements) of the rival portfolios disturbed in negative manner after IPO in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year after IPO. Leverage of rival firms show positive signs but this positive sign shows high debt to asset ratio which is not a good sign as it depicts increase in firm's financial risk. One of the possible explanations of this increase in debt to total asset is due to repurchase of shares by the rival firms in order to reduce the negative impact of IPO event on their share prices. Moreover, in low growth industries the existing firm tries hard to safeguard their market share and sales level from the new entrant that is IPO firm. For that purpose they need extra financing which can be fulfilled through extra debts.

Intra-industry share price volatility has also been measured from day 2 up to one years' time. The results show a significant positive impact of IPO event of rival firm share price volatility. The industry wise share price volatility indicate Fertilizer, Oil & gas, Technology & communication and Transport sector shows volatility in long run up to 1 years' time whereas Automobile, Cement, Chemical, engineering shows a short term price volatility from 1 week to 1 month time along with the above mentioned sectors.

In the same passion industrial concentration is measured in pre and post IPO settings to see whether it is affected through IPO event or not. Overall it's significant. While conducting industry wise analysis it is found that IPO reduce the industry concentration of Modaraba, miscellaneous, leasing, oil and gas and insurance sector and make them more competitive as compared to other sectors.

Comparing the performance of IPO and rival firms to see which outclass the other, it is found that although IPO exert negative impacts on its industry rivals but rival firm's performance is better than IPO firm in terms of ROA, ROE. However, short term working capital capacity and Leverage of IPO is better than its rival firms in 3 years post IPO.

The intra-industry performance is also confirmed through multivariate regression analysis. The performance of industry counterpart has been analyzed through the proxies namely; operating performance (ROA, ROE), leverage, liquidity and abnormal returns. The results indicate the significant negative impact of IPO event on industry rival firms operating performance, liquidity and abnormal returns. Only leverage position of the rival firms shows a positive sign but even it's not good as it depicts increase in debt burden (financial risk) of rival firms after IPO event. The proportion of low growth industries to high growth industries in Pakistan is high which results in overall performance decline in rival portfolios after the IPO event. As discussed earlier, in low growth industries IPO grabbed the market share of existing

firms especially if IPO firm is a new entrant which results in poor performance of rival firms after the event. The results are in line with the studies of (Akhigebi et al., 2006 and Hsu et al., 2010) who also documented decline in rival firm's performance after IPO event. However results are opposite from Li and Zhang (2021) who documented positive impact of IPO on its rival firms.

Industry wise detailed analysis revealed that Chemical, Food & personal care, Oil & Gas and Technology & communication showed an upward trend in their firms stock prices whereas the rest of the industries shown a decline in their stock returns. in long run only Oil & gas sector shows a significant and positive impact of IPO event.

Share price volatility of rivals firms has been noted in Fertilizer, Oil & gas, Technology & Communication and Transport sector which have shown a considerable volatility as compared to the other industries included in the study. Industry wise within competitive industry concentration Cement and Textile Spinning showed a significant positive while Miscellaneous and Modarabas has shown a significant negative impact on their industry concentration. In a concentrated industry environment again two sectors fertilizer and investment banks show an increase in concentration while leasing companies and Oil and Gas sector showing a negative impact of IPO event on their Industry concentration. Whereas as in a group of moderately concentrated industries all the three sectors namely engineering, food and personal care and insurance showing a significant negative impact of IPO event on their industry concentration. This mixed behavior of IPO event on industry's concentration of counterparts is because of the two reasons. If it results in decrease in concentration then it is because of a new entrant in the form of IPO firm which share the already divided market share among firms in the industry. This results in decrease in overall market concentration of the industry and it moves towards more perfect competition. The reason for increase in market concentration in some

industries is due to merger and acquisition which is a normal phenomenon associated with IPO event.

The study also make a comparison among industries by taking reference dummies to see which industry is more or less affected through IPO event. This methodology has been further bifurcated in to financial and non- financial sector. In a non- financial sector, Oil & gas sector has been taken as reference industry. The results revealed that firms in all non- financial sectors are less affected through IPO event as compared to firms in Oil & gas sector. Rank wise Transport, Automobile, Cement, Engineering, Chemical, Food & personal care and Fertilizer are affected through IPO event after the Oil & gas sector. The reason for this impact is since Oil & gas sector is a leading sector not in Pakistan but all over the world. Therefore firms operating in this sector are very active most of the time and this will depicts from any event and their response against that event. Similarly Industrial Transport, Automobile and Cement sectors are also remain in lime light and considered active and high growth sectors of Pakistan's economy.

In second group financial firms has been analyzed through reference dummy to see inter-industry impact of IPO event. Taking insurance industry as reference industry, the study found only commercial banks have more affected through IPO event as compared to insurance sector as it has a positive beta. While leasing companies, Investment firms and Modraba shows less impact of IPO event on firms operating in these sectors. The commercial banking is the oldest and more close to general public dealing which is known to both literate and less literate persons. Since more people deal in commercial banks as compared to other financial instructions in Pakistan, therefore any event like IPO brings more affects in firms operating in banking sector. To some extent people are also familiar with insurance sector which comes after the banking sector therefore investors take interest in event like IPO if it belong to insurance sector. However, industries like Modaraba, investment banks, leasing etc are not

very well known to people in Pakistan. Moreover, these sectors are not very well developed in Pakistan as the size of Pakistan's financial sectors and overall corporate sector is very small.

The second part of the study explores and analyze if any association exist between IPOs and external factors (Stock market trading volume, Stock Market performance, GDP growth rate, Industrial Production, Foreign Direct Investment and Interest Rate). The study has found a positive impact of GDP, FDI and interest rates on IPO numbers. Increase in GDP growth rate means a growing economy which requires more funding for firms and industries. The continue increase in GDP growth results in ever growing funding requirements which cannot be fulfilled through debts only. This ultimately leads to equity funding and results in more IPOs in the economy. FDI also shown a positive impact on IPO numbers which means IPOs can attract attention of the foreign investors which results in increase in volume of investment within the country. The results also show increase in IPO numbers due to interest rates. This means IPO provide an avenue to Pakistani firms to use equity option instead of using costly debts. However, Industrial production does not show any association with IPO numbers. On possible reason for this irrelevance IPO conducts in every sector which includes service, trading and manufacturing. So taking the dimension of only one sector will not provide any significance until and unless a huge number of IPOs conducted in manufacturing sector only. Similarly, the study finds no association between stock market variables and IPO numbers. This means IPO event is more of the economic event which is related to growing economic needs and not the event relates to stock market development or growth.

Overall the study contributes in two important findings. The first one is; IPO bring positive impacts on those industries which are having high growth prospects, which results in increase in the performance of overall industry after the event. For low growth and stagnant industries IPO is considered as negative event which grab the market share of existing firms. Therefore it is concluded that IPOs are only feasible in growing market environment. That is why growing



economies like USA, China and other big economies conduct more IPOs which depict their economic needs. This is further confirmed through the second part of the study where the study found that in comparison with stock market (Market index and trading volume) and economic development (GDP growth, FDI and Interest rate), IPOs are more associated with economic development and growth.

## **5.1. Research Implications**

The present study has the following implication for different levels.

### **5.1.1 Theoretical Implications**

Theoretically the research confirms both information effects in both positive and negative manner. The results of CARs show significant positive implications of IPO event on rival firms belong to Oil and gas, Chemical and Technology sector. IPO in these sectors depicts positive signals for investors about favorable industry prospectus. So they invest more in these sector's firms which results in positive returns for the overall sector. Contrary to that there are firms belong to industries like cement, commercial banks and engineering having stagnant growth are taking IPO as negative event. IPO means a firm is ready to the close scrutiny of external parties to receive benefits from listing itself. Like Zechner (2001), Stoughton et al., (2001) and Chod & Lyandres (2010) argued that only high quality firms will list themselves and generate a negative signal which became competitive threats to other firms operating in the same industry. This positive signal of IPO event further reduce the confidence of the investors, who either invest in IPO firms shares or withdraw their investment to avoid negative outcomes of IPO event. In both case it results in decline in rival firms share prices.

Similarly, the study also endorses supply effect. IPO helps in reducing the industry concentration and market share of existing firms if they belong to oil & gas, Engineering, food and personal care and insurance. For such industries IPO will result in more perfect

competition. Hence proved the notion that, addition of a big asset (IPO firms) results in declining the prices of existing assets (rival firms market share and profitability) (Braun & Larrain, 2009). For few industries like cement, textile and banks, IPO event leads towards increase concentration. The possible reason for such concentration is more merger and acquisition after the IPO which is a usual phenomenon associated with IPO (Hsieh, Lyandres Zhdanov, 2011). Overall, the present study negating the idea of Scholes (1972), Shleifer (1986), that changes in asset supply does not affect the prices of existing assets in the world of flat demand curve and support the idea of Braun and Larrain (2009) which states a supply of new asset negatively affect the price of exiting assets. Most recently Li and Zhang (2021) support the idea of a positive valuation effects in the existing assets due to a new asset supply by substitution hypothesis.

### **5.1.2 Practical/ Managerial Implications**

The study suggests individual investors and portfolio managers to retain existing firm shares (in short) if firms belong to oil and gas, chemical, food & personal care and technology & communication, as they provide positive returns to existing firms after the IPO event. On the other hand, firms belong to financial, engineering and textile sector show negative impact of IPO therefore it is beneficial for investors to buy IPO firms shares after the event. In long run, only oil and gas sector offer positive returns whereas chemical, financial, engineering, food & personal care and technology & communication offer negative returns to existing firm's shares after the IPO event. IPO event also decrease industry concentration and industries move from monopolistic to perfect competition, except, cement, textile, fertilizer and investment bank. The possible reason for the positive concentration is due to more merger and acquisition in these sectors that results in increase the degree of concentration after the IPO event. In additional the present study also suggested sectors like Modarabas, miscellaneous, leasing, oil & gas, insurance, engineering and Food & personal care decrease in their concentration after

the IPO event and these industries move from monopolistic to perfect competition. This is important for the management of firms belong to these sectors to make themselves ready for more competitive environment, more research and development expenditure, strong efforts to retain market share and face high product market competition especially if they belong to industries with stagnant growth.

With reference to number of IPOs and external factors, the results indicates that IPO event is more associated with growing economic needs as compared to stock market development and growth. Increase in GDP, FDI and Interest rates results in more IPOs.

### **5.1.3. Policy Implications**

The present study will help the policy makers to understand the importance of IPOs. The IPO event is not limited to IPO firms but it has consequences to its rival firms and the industry as a whole where it takes place. IPO are essential for fulfilling growing economic needs as the present study find the positive and significant impact of GDP, FDI and Interest Rates on occurrence of more IPOs. If we see the last 5 years both US and China conducts more than 300 IPO every year in last 5 years. Regionally, India conducts 32<sup>8</sup> IPOs per year in last 5 years. The results of the present study indicate a positive outcome of IPO if it belongs to Oil & gas, Chemical, Food & personal Care, Technology etc. There is a need to encourage these sectors to conduct more IPOs which will be beneficial for both IPO and rival firms. The present study also found a significant positive impact of interest rates on IPO numbers. This means, in the environment of high cost of debt which is now spread throughout the world and especially in Pakistan (22%)<sup>9</sup>, the alternate mode of financing is equity offerings which can be done through either IPOs or SEOs (Seasonal Equity Offerings).

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<sup>8</sup> Statista

<sup>9</sup>State Bank of Pakistan

## **5.2. Directions for Future Research**

So far the study has been ended up with showing Intra-industry implications of IPO. However, the IPO intra-industry implications can be further extended to what sort of strategies adopted by rival firms to save themselves from negative implications of IPO event. Moreover, how intra-industry impact varies in different economic environment like boom, recession etc. In addition, the research on IPO and external factors can be further extended to other market and economic variables to see how IPO respond to such factors.

## **5.3 Limitations of the Study**

The present research has certain limitations. The present study could have been further extended to IPO completion and withdrawal and their impacts on rivals firms but due to unavailability of data such analysis could not be performed. In order to obtain firm and industry level data, the study mostly rely on available Annual reports from 2000-2016. Similarly, macroeconomic level data was only available in annual frequency which creates a problem of less observation for analysis and matching with other variables.

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## Appendixes

### Web Sources:

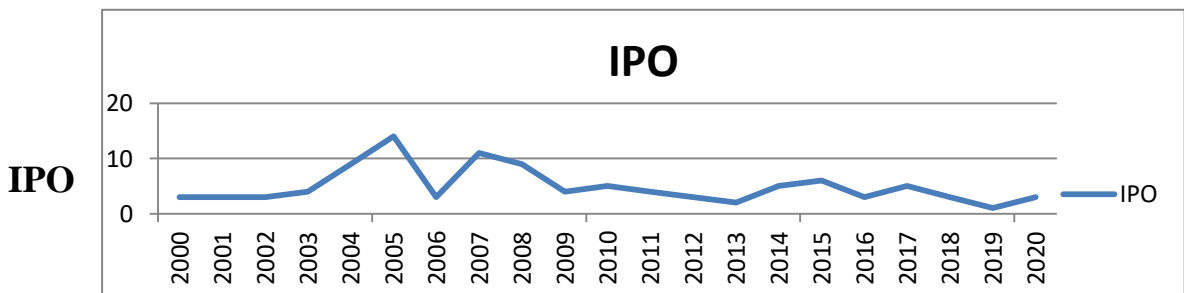
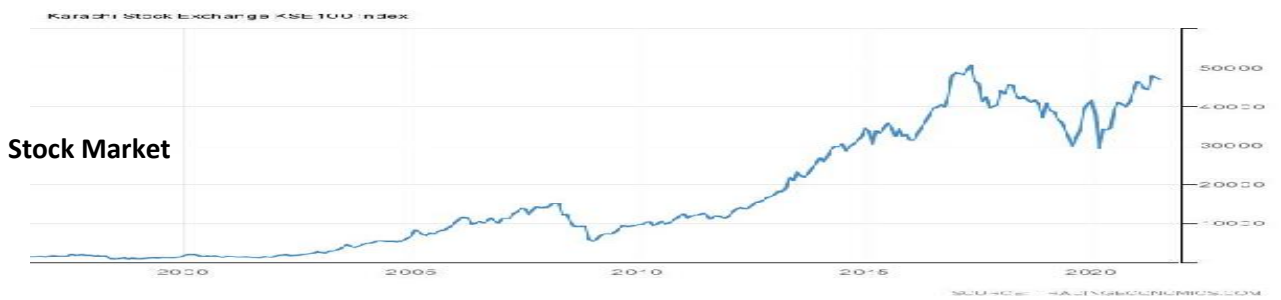
<https://www.secp.gov.pk/media-center/annual-reports/>

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www.tradingeconomies.com

**Figure: Comparison of GDP, Stock Market and IPOs from 2000 to 2020**



## Comparison of GDP ranks and Average number of IPOs

S.No.	Countries	GDP Rank	Avg. No. of IPO (2011 to 2016)	Reference
1	Taiwan	22	20	TWSE, Taiwan
2	Poland	24	40	WSE, Poland
3	Pakistan	25	5	PSX, Pakistan
4	Malaysia	27	14	Bursa, Malaysia
5	Netherlands	28	7	Euronext, Europe

**Source:** Report of Selected Countries Group and Subject (PPP valuation of country GDP)"IMF. Retrieved 13 June 2016.

## Industry wise Distribution of IPO Events

S. No.	INDUSTRY NAME	EVENT COUNT
1	AUTOMOBILE	1
2	CEMENT	5
3	CHEMICAL	6
4	COMMERCIAL BANKS	7
5	ENGINEERING	4
6	FERTILIZER	2
7	FOOD & PERSONAL CARE PRODUCTS	2
8	INSURANCE	1
9	INV. BANKS / INV. COS. / SECURITIES COS.	17
10	LEASING COMPANIES	1
11	MISCELLANEOUS	4
12	MODARABAS	5
13	OIL & GAS EXPLORATION COMPANIES	2
14	OIL & GAS MARKETING COMPANIES	3
15	POWER GENERATION & DISTRIBUTION	8
16	REFINERY	1
17	TECHNOLOGY & COMMUNICATION	14
18	TEXTILE COMPOSITE	1
19	TEXTILE SPINNING	4
20	TEXTILE WEAVING	1
21	TRANSPORT	1
	<b>TOTAL</b>	<b>90</b>

## Year wise Distribution of IPO Event

S. No.	Year	No. of IPO
1	1998	1
2	1999	0
3	2000	3
4	2001	4
5	2002	4
6	2003	4
7	2004	9
8	2005	14
9	2006	3
10	2007	11
11	2008	9
12	2009	4
13	2010	5
14	2011	4
15	2012	2
16	2013	1
17	2014	5
18	2015	5
19	2016	2

## Panel Regression Results of IPO intra-industry impacts

OP (ROA)	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO Dummy	-0.034	.0075	-4.53	.000	-.753	.785	***
Log(ROA)	0.043	.0026	1.64	.054	104.325	236.153	*
Log (Age)	-0.087	.0072	-12.06	.000	-.378	.106	***
Log (Size)	0.006	.0019	3.11	.001	45.425	127.046	***
Ind. M/B	0.071	.0153	4.63	.000	102.325	219.153	***
Constant	0.137	.024	5.59	.000	-20.048	-3.699	***
Mean dependent var		3.720	SD dependent var			5.960	
R-squared		0.031	Number of obs			217	
F-test		10.707	Prob > F			0.000	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

OP (ROE)	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO Dummy	-0.031	0.007	-4.49	.000	-.096	.147	***
Log(ROA)	0.039	0.027	1.41	.083	25.529	36.97	*
Log (Age)	-0.087	0.230	13.06	.000	-.145	-.047	***
Log (Size)	0.006	0.001	3.01	.002	11.433	19.296	***
Ind. M/B	0.071	0.015	4.71	.000	.167	.178	***
Constant	0.132	0.028	4.59	.000	-1.952	-.151	***
Mean dependent var		3.720	SD dependent var			5.960	
R-squared		0.042	Number of obs			217	
F-test		11.940	Prob > F			0.000	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Leverage	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO Dummy	0.107	0.024	4.43	.000	-.289	-.0406	***
Log(ROA)	0.197	0.006	29.13	.000	-.470	-.298	***
Log (Age)	0.114	0.013	8.52	.000	-.181	-.054	***
Log (Size)	0.008	0.003	2.45	.009	10.533	15.076	***
Ind. M/B	0.237	0.0336	7.04	.000	75.154	100.5	***
Constant	.097	0.0047	2.17	.000	21.362	30.12	***
Mean dependent var		3.720	SD dependent var			5.960	
R-squared		0.040	Number of obs			217	
F-test		9.771	Prob > F			0.000	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Liquidity	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO Dummy	-0.036	0.013	-2.76	0.003	.0695	.211	***
Log(ROA)	-0.024	0.008	-2.85	0.002	-.000	-.000	***
Log (Age)	-0.032	0.011	-2.90	0.002	-.148	-.0221	***
Log (Size)	-0.029	0.011	2.44	0.007	-.035	.004	***
Ind. M/B	-0.017	0.008	-1.96	0.025	.002	.036	***
Constant	-0.036	0.014	-2.47	0.007	406.952	-131.713	***
Mean dependent var		3.720	SD dependent var			5.960	
R-squared		0.07	Number of obs			212	
F-test		8.256	Prob > F			0.000	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Abnormal Returns	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
IPO Dummy	-0.043	0.016	-2.64	0.004	-.181	-.054	***
Log(ROA)	-0.022	0.006	-3.63	0.000	10.533	15.076	***
Log (Age)	0.003	0.004	0.63	0.264	75.154	100.5	
Log (Size)	0.008	0.001	5.25	0.000	45.425	127.046	***
Ind. M/B	0.022	0.009	2.41	0.008	102.325	219.153	***
Constant	0.072	0.027	2.63	0.004	-20.048	-3.699	***
Mean dependent var		3.720	SD dependent var			5.960	
R-squared		0.07	Number of obs			214	
F-test		10.820	Prob > F			0.000	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$