

**Value-Glamour, Accrual and Distress Anomaly:  
Same or Distinct Phenomenon**

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**To my parents...**

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## **Abstract**

Many researches are done in search of abnormal returns in many financial markets. This study tell how different anomalies gives abnormal returns and more importantly how these anomalies differ from each other in term of future abnormal returns. This will provide ground to earn arbitrage to investors by going in different strategies for different anomalies. If two anomalies gave significant positive future abnormal returns it means that both of these anomalies are not alike and investors can step in both of them at a same time to get arbitrage.

# Chapter 1

## Introduction

### 1.1 Introduction

Since the asset pricing explanation of excess returns by Fama and French (1974) an extensive discussion had started and continues till now and many different explanations are also given by others to capture this excessive return phenomenon. Many anomalies are found in finance and accounting literature time to time those tend to elaborate that how way of investment in stock market tilt away from basic axioms. Value-Glamour anomaly is used extensively in finance literature, firstly by Graham and Dodd (1934), book to market (BM) and cash flow from operations to market price (CFOP) anomalies are its major proxies. Bedrock of value-glamour anomaly is that stocks with high BM value and high CFOP value are known to earn positive abnormal returns in future, which contradict to basic risk and return theories and Warren Buffet is major player who is known by value investor guru.

While major accounting anomaly, accrual anomaly (ACC), which was introduced by Sloan (1996), shows that stocks with low ACC usually earn positive future abnormal returns due to it smart investors can get arbitrage by going is this type of hedging strategies. Second accounting anomaly is financial distress (FD) anomaly which stands on ground that firms with high distress risk tend to earn future abnormal returns as observed by Dichev (1998).

By looking into ground of these anomalies, two main tenets of their justifications are found. First is conventional one and based on efficient market hypothesis (EMH) of Fama and French (1992, 1993, and 1996) which explain these anomalous trends as all of these investment strategies, which cause abnormal returns, are basically compensation

of risk associated with them individually. While second tenet for justification of these anomalies is behavioral aspect, which demonstrate that not every investor is able to use all information efficiently and due to this lag of rationality investors made errors in expectation (Lakonishok et al., 1994; Dichev, 1998). Behavioral school explains this as investors made huge positive expectations (over-estimate) about stock of low BM, low CFOP, high ACC and low FD but they are surprised in future when face negative abnormal returns due to mean-reversion of returns. Due to this cause earnings of high accrual firms go down in future, growth stocks also move back to their mean path and expectations break-up. Similarly, investing in high FD firms also causes same type of expectation break-ups as investors put more emphasis solely on profit of firms and ignore share-holder equity or distress conditions of firms.

All of these three anomalies are also tie-in due to given reasons. First, all these anomalies are linked with future stock returns so they may be manifestation of unique underlying phenomenon. Second, value-glamour anomaly may relate to accrual anomaly as it is observed by McNichols (2000) that forecasted growth has positive relation with discretionary accruals. Similarly, accruals are also linked with financial distress of firms and at the same time it may have significant effect on value stocks. So, three interconnected anomalies yield three relationships among them. Third, it is seen in past that research on forecasted returns and their relationship with anomalies is apart by short-term continuation (under-reaction) and medium to long-term reversal of returns (over-reaction) and all of three anomalies are interlinked with reversal of returns or have same ground on which they are connected.

Along with portfolio hedge strategy this study will also consider the regression analysis of future stock returns on various variables associated with all three anomalies in spirit of Fama and MacBeth (1973). Relation between returns and other variables

may be linear or non-linear Hematfar and Salahi (2012) and both of these aspects needs to be captured but this study will focus only on linear relations and compare differences in returns with portfolio hedging.

This study crutch literature as no other study is found on dissecting relationship among these three anomalies in Pakistan that are these anomalies differ significantly from each other in attributes or have same ground of factors on which these are based on. Even accrual anomaly is recently found in Karachi Stock Exchange (KSE) by Jawad and Javaid (2015). Distress anomaly is found also in near past by Bharna & Shim (2014) and Zaretsky & Zumwalt (2007) but to find it in Pakistan this study will examine O-score (Ohlson, 1980) for firms on KSE. But if distress anomaly is not found in Pakistan then analysis will be limited to relationship among accrual and value-glamour anomaly Taylor (2011) and Desai et al. (2004). O-score will also be measured as not available before and it will also be some incremental work in literature for Pakistan.

### **1.1 Significance of Study:**

Extensive research has been done on earning abnormal returns from various financial market anomalies but majority of these studies found future abnormal returns by going in only single investment strategy. A step ahead from previous studies Desai et al. (2004) first find out abnormal returns by going in two different strategies at the same time and check whether two anomalies are same or different in term of giving future abnormal returns but don't take into account financial distress anomaly.

In case of Pakistan, value-glamour anomaly is found many years ago and accrual anomaly is recently found by Jawad and Javaid (2015). Financial distress anomaly is not yet found in KSE and O-score is measured to capture financial distress as proposed by Ohlson (1980) which is also not calculated for KSE. Major gap is that it is never



examined in past that whether all of these three anomalies are same or distinct from each other in relation to future abnormal returns. Secondly, two different approaches are used to test relation among these anomalies which are regression analysis in spirit of Fama and Macbeth (1974) and Taylor et al. (2011) and results of these two methods can also be compared and tend to give accuracy in results.

So, this study take into account all the three anomalies at a time and also for three years in future size-adjusted returns are analyzed which gives more holistic picture of presence of future abnormal returns.

## **1.2 Objectives:**

As three anomalies tie-in like three aspects so there will also be asymmetry which causes three distinct relationships to test among these anomalies. So, the three objectives of this study on baseline of three relationships between three anomalies are to find;

1. To find whether Value-Glamour, Accrual and Distress anomalies exist in KSE.
2. To check Value-Glamour, Accrual and Distress anomalies are manifestation of same or distinct article.

## **1.3. Hypothesis:**

To achieve listed objectives two methods will be used among which first is to use three investment strategies which are basic, combined and non-overlap hedging in spirit of Desai et al. (2004). And second approach is by going for regression analysis as proposed by Fama and MacBeth (1974). Under both of these methods we have to check

whether anomalies gave abnormal returns or not and for this purpose the following alternative hypotheses are developed.

**Ha (1).** Value-Glamour anomaly is present in KSE.

**Ha (2).** Accrual anomaly is present in KSE.

**Ha (3).** Financial distress anomaly is present in KSE.

**Ha (4).** Value-Glamour, Accrual and Distress anomalies all are distinct phenomenon from one another.

## **Chapter 2**

### **Theoretical Review**

#### **2.1. Theoretical Background:**

Efficient market hypothesis (Fama, 1970) define financial market as an efficient market in which investors are rational having all information which is free of cost and all this

information is fully reflected by the equity prices of that market. In insignificant span of time stock prices of whole market adjust to new piece of information.

Efficient market hypothesis (EMH) divides market in three forms on the basis of type of information availability to investors. First is weak form of market efficiency which assumes that all past information regarding equity prices and their returns are available to all investors and these prices follow random walk so their return can't be forecasted. So, no one can get abnormal return if the market lies in first category and it is impossible to beat the market but by fundamental and technical (trends) analysis one can judge the expected moving path of prices. In second form of market efficiency equity prices shows all publically available information and previous information of returns as well. Here, also, investor cannot get abnormal returns as they don't have private or inside information but by inside information any investor can beat the market. Last is strong form of market efficiency, in which all three types (past, public, and private or inside) of information are available to the investors and they can't beat the market as everyone have same information at same time.

If we now come to other side of the coin we see there are different anomalies in financial markets where, anomaly is the occurrence of any unusual or bizarre events which is not explained by the standard theories. George & Elton (2001) explain concept of anomaly as it is scientific matter which occurs in exceptional conditions due to any irregularity in common order. So, anomaly is an unexpected phenomenon to any basic theory or model. As anomalies show divergence from core theory of any subject so it has its own reason to occur in specific situation or in specific market and where there exist any anomaly that specific market is regarded as inefficient one. Or it can also be stated as the markets, those are not working on any specific theory or model i.e. FMH, they are anomalous markets. Anomaly is divergence of any process from previously

accepted paradigm, but it has huge impact on surroundings to be ignored (Kaheman & Tverky, 1986). Anomalies have different nature depending on many aspect i.e. anomalies can occur once only and then disappear, or it can happen frequently in any market.

Similarly, if anomaly is seen only under finance it is like deviation of stock prices or their group from standard theory of finance (FMH). So, these types of events in financial markets are known as financial market anomalies (Silver, 2011). On bedrock, financial markets can be branched in three types as calendar or seasonal anomalies, fundamental anomalies and technical anomalies. Seasonal anomalies are anomalous behavior of stock prices in particular time span like in special days, months and years like weekend effect (Smirlock & Starks, 1986), January effect (Keims, 1983), turn of the year effect (Agrawal & Tandon, 1994) etc. Fundamental anomalies shows irregularities among fundamentals of different companies like Value anomaly (Graham & Dodd, 1934), Price to book value (Fama, 1991), Price to earnings (Goodman & Peavy, 1983), Neglected stocks (De Bongt & Thaler, 1985) etc. Last one is technical anomaly which occurs in technical analysis of using various techniques to predict future stock prices on bedrock of past information. On the basis of strategies used in technical analysis the two main technical anomalies are moving average (Brock, 1992) and trading range break (Lakonishok et al., 1992).

These irregularities, which we name anomalies, are conducive for finance itself as if many times anomalies don't give anything new but they do apart the already existing paradigm in the field so it gives base for emergence of new theories and models (Kuhn, 1977). Various models are rendered to explain the causes of anomalous divergence from efficient market hypothesis. Firstly, three factor model of Fama & French (1993) gives causes of this abnormal behavior of stock prices, which causes many anomalies, by

introducing risk factors in his models but after some time it is again criticized by Daniel & Titman (1997) for not giving explanation of long term effect on stock returns. Brek et al. (1996) give another explanation of size effect and momentum anomaly by introducing a non-linear model to forecast stock return but it was quite arduous in using for empirical testing.

Regarding bedrock of various explanation of earning arbitrage by different investment strategies Boudouk et al. (1994) stresses on three distinct schools of thought. First school of thought relies on efficiency of financial market and put stress on EMH that its factors gives true explanations of anomalous effects being occurred in the markets as economic risk premium and this school is named as Revisionist. Second school also perceive that markets are efficient in all, time and information, aspects but they explain anomalous phenomenon as it is caused by measurement errors in contrast to revisionists. This school is called loyalists. Last school is Heretics, which believe in behavioral causes that give birth to abnormal returns in financial markets. They contradict with rational school's reasons and view this arbitrage as psychological behavior of investors regarding occurrence of over and under-reaction of financial markets. So, in contrast to revisionists they thought that all investors are not rational but there only small no. of them those earn abnormal gains due to mispricing of stock prices caused by irrational behavior of majority of investors.

Wouter (2006) also support this argument but he distributes schools of thought in two as Revisionists and Heretics on ground of explanation of anomalous trends in market. His results are supportive to Boudouk's work. Barberis and Sheilfer (1998) go one step beyond towards explanation of under-reaction of stocks. They argue that investors stuck on the past information and their expectations are also regarding pattern of stock movement, coherent with their past movement. So, due to slow reaction of

investors, named as Conservatism, under-reaction mostly happened. Similarly, over-reaction of market is explained by Tversky and Kaheman (1974) as investors tend to perceive future trend of stock prices on the basis of available information to them and mostly over-value the prices but their expectations collapse when path is mean reverted in the future.

## **2.2 Value-Glamour Anomaly:**

Rich and huge literature present different measures of relative value, such as cash flow to price ratio, book to market ratio, size, dividend yields, earnings to price ratio and also show relation of these value stocks with stocks returns in future ( Basu, 1977; Rosenberg, et al., 1985; Lakonishok, et al., 1991; Fama and French, 1992; etc). Extensive literature highlights that glamour stocks underperform value stocks but reason of this differential in returns is a rich subject of debate till now. Two main streams of this subject are returns differential due to compensation of risk to an investor or due to mispricing errors in expectations by investors.

Fama and French (1992) explain returns differential as compensation for risk of financial distress, reflected by book to market ratio and also add that book to market ratio has much larger predictive power than other value-glamour proxies. Under risk based interpretation it is also observed that there exist inverse relation between book to market values and future earnings of the firms ( Fama and French, 1995). While Chen, Petkova and Zhang (2008) examined that a stable return differential across value and glamour firms exist over last fifty years. Some literature gives evidence that value-glamour stocks have sensitive relation with macro-economic risks over time which gives another reason that value stocks may outperform glamour stocks due to these macro-economic risks ( Vassalou, 2003; Santos and Veronesi, 2010; Cohen, et al., 2009; Zhang, 2005; Lettau and Wachter, 2007).

In contrast to risk based, market based explanation of why value stocks outperform glamour stocks, argue that relative value i.e. size, cash flow to price ratio, book to market ratio etc. reflect pessimistic and optimistic expectation regarding future returns for value and glamour firms respectively. Lakonishok, et al., (1994) argue that investors over rely on historic fundamentals of value and glamour stocks which is due to fundamental difference of financial conditions of value and glamour stock. Due to these differences of basic conditions of financial variables investors over look tendency of these variables of mean reversion. So, pattern of value-glamour anomaly is created due to these biased expectations of investors towards newly available financial information.

There exist positive relation among future returns and book to market ratio and also with value stocks and negative with glamour firms (Penman, 1996). Along with these expectation biases LaPorta (1996) and Dechow and Sloan (1997) find that systematic error prevail in making expectations regarding long term future returns for value-glamour strategies. Investor sentiments also have crucial role in explaining value-glamour phenomenon as Baker and Wurgler (2006) argued that returns to value-glamour strategies link with periods of high and low investors sentiments so, when investor sentiments are high than returns by value-glamour strategies are also greater and vice versa.

Lakonishok et al. (1994) also examine whether the stocks of value firms are more risky than that of glamour firm's on the basis of its fundamentals. This concept reveals that glamour stocks underperform value stocks with high frequency and especially in those markets where high marginal utility of wealth is present. Comparison among these different types of stocks is made between past, future and expected earnings from them. And contrarian model also gives consistent results as higher returns can be earned by going into various value strategies.

It is also crucial to look upon factors captured by book to market ratio as low book to market ratio may show large amount of intangible assets like research expenses but as these expenses are not incorporated in accounting of book value of firms, because research and development expenses are headed by expense account, so it may not be easy to truly capture reasons behind low book to market ratio. Similarly, a firm with huge growth opportunity is not mirrored by book to market ratio because growth opportunities may be seen in market prices of firm but not in book value due to which low book to market ratio may be misleading.

Hackel et al. (2000) report another asset price anomaly that is cash flow to price ratio and it is also used as proxy for value-glamour anomaly. They examine hedging strategy based on cash flow to price ratio outperform many other benchmarks. And also argue that there exists no significant link between cashflow to price and other asset pricing anomalies but before them Lipe (1986) observed that future returns of the stocks can be explained by useful information of financial statements. Moreover, Livnat and Zarowin (1994) and Kallunki et al. (1998) also illustrate that cash flow to price ratio have incremental information to explain variation in returns of stocks across various cross sections.

### **2.3. Accrual Anomaly:**

Accrual anomaly defines relationship among accruals and stock returns of the firms. Pioneer of accrual anomaly is Sloan (1996) who tests the theory that investors who forecast future stock returns, fail to fully understand the difference among persistence of cash flow and accrual parts of earnings. Accrual part of earning is less persistent than cash flow part and low accrual leads to high abnormal stock returns in the future and vice versa. This relation between stock returns and accruals may show proper strategy to



use accruals in forecasting future returns. More interest of researchers explains quality of earnings under different definitions and methods to calculate accruals.

Apart from Sloan's definition of accruals that accrual is measured as change in net operating assets, Healy (1985) and Jones (1991) define accruals as noncash items like depreciation, contingent liabilities/assets, or noncash working capital. But since the use of cash flow statement as a part of financial statement, definition of accruals changes once again from balance sheet approach to cash flow approach. As Hribar and Collins (2002) states that cash flow method to measure accruals is more appropriate than balance sheet approach as later one may diminish the required results. So, under this cash flow method, accruals are measured as difference of earnings before interest & taxes (EBIT) and cash flows. Another definition of accruals is proposed by Richardson et al., (2005) under the concept that all accounts in balance sheet are based on accrual accounting system so accruals can be measured as change in net operating assets (NOA) other than cash.

Sloan (1996) affirms that when earnings are computed prematurely by accruals some of forecasted earnings may not be realized and this is point which raises interest of many researchers towards it. This point also states that quality of earnings is dependent on accruals. Overvaluation of earnings of the firm occurs when its cash flow part of earnings is lower than accrual part and vice versa. So, due to this over or under valuation of earnings investors may not be able to perceive true quality of earnings. Accruals have two major components related to assets and liabilities that's why accruals represent forecasted future benefits based on change in NOA. Under Sloan's definition of accruals, it can be defined as change in non-cash assets in current period. So, this method is based on balance sheet approach and involves changes in current assets liabilities.

Richardson et al. (2005) gives another explanation for accruals that it is calculated by adding change in non-current net operating assets, change in current NOA and change in net financial assets. They empirically test these models for accruals to check the persistency of earnings based on accruals. Hirshleifer et al. (2004) also report that net operating asset is better to use for forecasting of future stock returns and also to diminish investor's misperceptions. They calculate NOA as sum of total investment and total operating accruals. He also find out that net operating assets used as proxy for accruals, lagged by total assets of previous year have negative relation with future stock returns. And this relation is examined for 1 to 3 years ahead future stock returns. But Richardson et al. (2006, b) find out that when net operating assets are lagged by previous year's total assets this proxy no longer capture past difference among total earnings and cash flows or it can also be stated as when net operating assets are scaled by previous year's total assets than it capture relation of future stock returns with total earnings but not with accrual and cash flow components of earnings separately.

Apart from change in net operating assets lagged by total assets Richardson et al. (2006, a) scale change in net operating assets by last year's net operating assets. And NOA are calculated by subtracting operating liabilities from operating assets. Fairfield et al. (2003) considers only working capital as accrual and also that non-current accruals are form of growth in earnings. After detailed discussion on methods and calculations of accruals these methods should also be compared. All of these methods have same base as all uses difference of assets and liabilities. More differences occur when we go into their detailed formulas. Sloan (1996) considers net current assets which examine short-term benefits of accruals due to its nature while all other methods consider long-term benefits as they consider non-current assets. This difference of long and short-term analysis of accruals exist due to tendency of reversion as current assets reverse quickly

but on the other hand non-current assets reverse in longer time. Depending on the expectations of investors few of them are interested in forecasted returns that will reverse in short period of time and not in forecasted returns that may realized in relative longer time period. So, due to this time dimension and difference in expectations of investors, some of the models of accrual determination which are conclusive for one group of investor may not be relevant for other investors.

If we compare model on these bases of time and expectations than we come to know that Sloan's model is much introverted as it does only focus on short term dynamics because it does not contain non-current assets. Richardson et al. (2005) model have some financing elements and these elements are not proper forecasters of future returns. Similarly Hirshleifer et al, (2004) model also seems to have some trouble as it consider level variables and Richardson et al. (2006) explain that focusing only NOA may show focusing only earnings but not its components. Richardson et al. (2006a) model includes both type of NOA, current and non-current assets, scaled by total operating assets. So, Sloan's model capture short term benefits and Richardson's mode is more useful investors focusing long term benefits.

By comparing two approaches for computation of accruals, balance sheet and cash flow approach, it is seen that balance sheet approach is the most common in literature and cash flow approach become fascinating since the contribution of Hribar and Collins (2002). They show that balance sheet approach can affect tests used for earning management. Balance sheet method is mostly used in literature when there is not large data set to measure accruals and both of these methods have pros and cons depending on their measuring method.

#### **2.4. Distress Anomaly:**

Like other anomalies financial distress anomaly may have two explanations for its occurrence. It may happen due to riskiness of stocks those are in high financial distress zone and high stock returns in future may be earned for this compensation of risk that investor bear and second is behavioral explanation which is based on misevaluation of stocks as investors don't expect high return from distressed firms but stock prices move towards their mean in future and arbitrage can be captured. But opposite may also be possible as CHS (2008) explain that some investors may have preference to hold stocks of distressed firms to get private benefits like acquiring the companies output etc. There may be another explanation for distressed firms to be less risky as high distressed firms are mostly acquired by other large companies and due to this acquisition, merger or joint venture, whatever happen, distressed firms are no more risky to that extent and it is majorly due to takeover legislation (Nenova, 2006).

Distress anomaly mostly exist in developed than emerging markets and Eisdorfer et al. (2014) find out that it is stronger in markets which have easy access to low cost loans, comparatively harder takeover legislations, transparency of information and relatively lower barriers to arbitrage. Similarly various types of investors and their strategies may play significant role in the happening of distress anomaly.

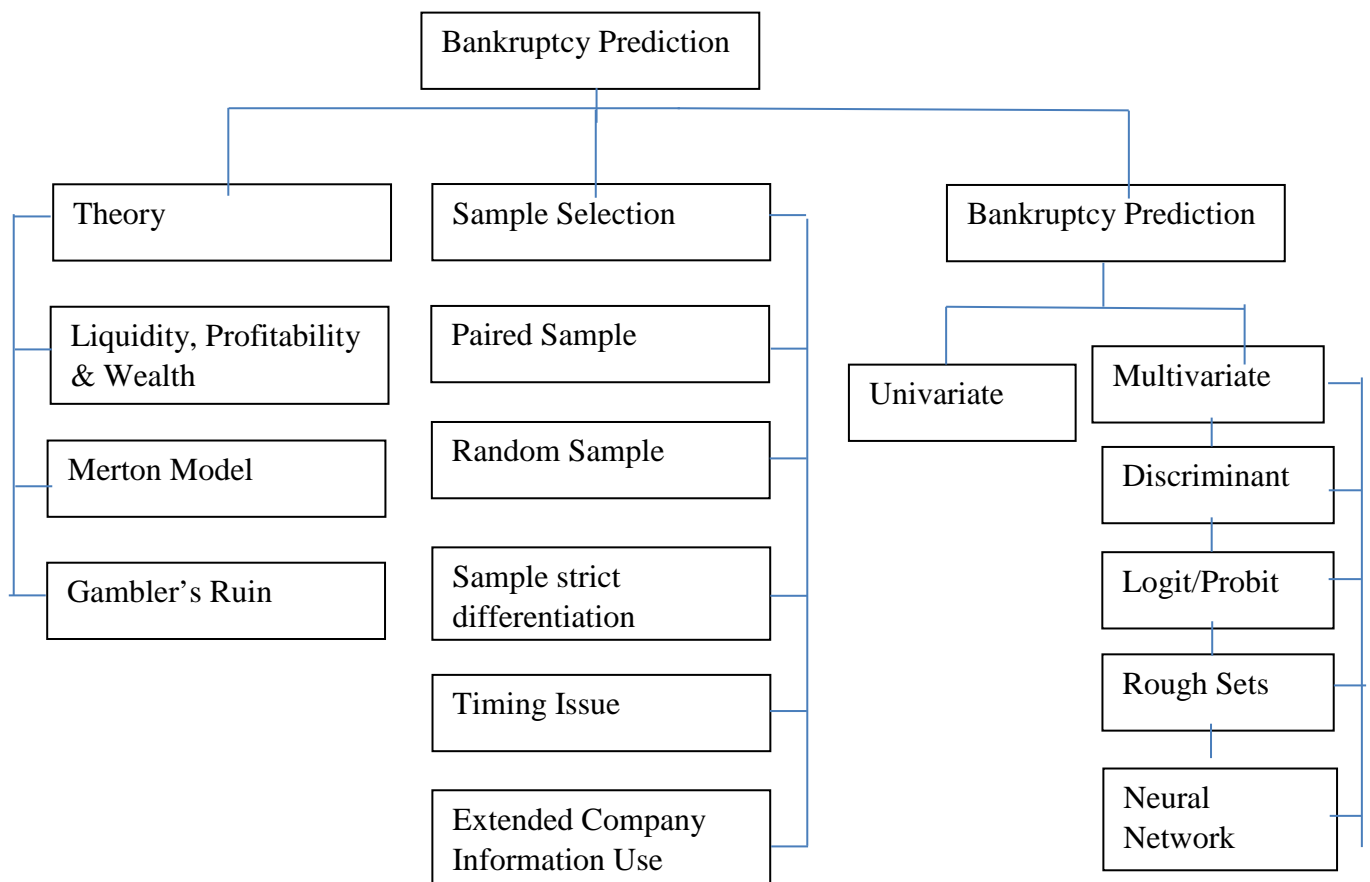
Distress anomaly may happen due to unexpected changes during sample period (CHS, 2008) and Chava and Purnanandam (2010) said that the relation between financial distress risk and expected future returns is positive actually but the negative relation among them, according to many studies, is due to low earnings on future stock returns that have not been forecasted by the investors. So, they argue that distress anomaly may be in-sample phenomenon which is unlikely to exist in future. So, many explanations for different relation of distress risk and future stock returns are there and mostly negative relation is found in literature.

### **2.4.1. Financial Distress:**

In contrast to theories of capital structure (Miller and Modigliani, 1958) those were based on theoretical background and propositions, bankruptcy research started from empirical testing to ascertain whether the company is going to bankrupt or its financial health is impoverishing. Large number of bankruptcy prediction models can only conclude whether the firm is bankrupt or non-bankrupt, but these models can't adduce that why any firm is going to be bankrupt or why some ratios have more predictability power than others. Basically there is a massive lack of a strong theoretical background in auguring bankruptcy of a firm but these were by new econometric models and more empirical testing. The advantage of strong theoretical background is that it emphasizes on explaining the backhand reasons and process rather to repeat the same empirical test on driven data with various tools to prove something like it is the fact. It is examined that bankrupt firms have same potential of bankruptcy which shows similar features of firms but can theoretical framework of bankruptcy explain this repeated features in similar firms? Empirical result of each research should be evaluated on its own features and should explain the patterns of concluded empirical results. Present stage of bankruptcy forecasting field has no direction and each empirical result is keep revolving around different econometrics tests without encountering the real research problem. The main advantage to build a linkage between bankruptcy forecasting and other theories of finance like efficient market hypothesis, capital structure etc. is that it gives us a vast picture as to where the study is trying to drag us as well as this linkage also provide us reason of why so many researches on bankruptcy prediction only focus statistical models. Bankruptcy predictability is started to attract many researchers after the Great Depression of 1930. First of all Bureau of Business Research start studying the ratios of failing manufacturing firms and bulletin is also published in 1930. After this initiative of

BBR FitzPatrick (1932) also extend this work by selecting 13 ratios of 34 firms having same sample of failed and healthy firms and use trend analysis technique for the comparison of ratios of these two groups. By trend analysis and comparing ratios of failed firms with that of healthy firms he found that healthy companies have favorable ratios as compared to failed firms. Smith and Winakor (1935) extend previous work of BBR and oversize its sample to 183 failed firms from different industries. They also found, after comparison of failed and successful firms, that failed firms show sign of weakness about four to five years before its occurrence. Jackendoff (1962) assess the ratios of firms by dividing them in two groups as profitable and unprofitable and adjudge that current and working capital ratios are higher for first group.

**2.4.2. Frame Work for Distress Risk:**



**2.4.3 Bankruptcy Prediction Research:**

Pioneer issue that must be resolved first is the ‘what is bankruptcy?’ Some early studies of 1930 to 1965 take bankruptcy as ‘business failure or failing firms’ but they didn’t specify this in broad terms that weather these are bankrupt firms of only underperform relative to more successful firms. Initially this term of bankruptcy was used by Beaver (1966). It was also reported that there exists a several set of failure definitions used for prediction models. Various studies take failure as filing of bankruptcy of the firm in actual, other take it as only suffering from financial stress or if they can’t meet the financial obligations. This huge difference in definitions of bankruptcy makes it hard to compare various models.

One of the early works, in forecasting of bankruptcy of companies, is of Beaver (1966) who investigate 30 ratios of 158 firms (79 non-failed and 79 failed) from 38 industries. And then on its basis he examined predictive ability of individual ratios in classifying the failed and non-failed firms. Beaver concluded that highest predictive ability is 92% correct one year prior to bankruptcy of Net Income to Debt ratio, after it there came Net Income (NI) to Sales ratio with an accuracy of 91% and Cash Flow (C.F) to Assets, NI to Net Worth & C.F to Total Debt have an accuracy of about 90% one year prior to bankruptcy. He also recommended that multiple ratios, those are considered at the same time, may have much more forecasting power than single ratios, and that was the starting of bankruptcy predictions models at that time.

There were two main streams to analyze bankruptcy of companies, univariate and multivariate analysis. In case of univariate analysis it is assumed that only one variable has influence on the response variable and in other case assumption is that more than one can influence the response variable.

Pioneer of multivariate analysis was Altman (1968), suggested that ratio analysis has no more importance as an analytical technique because of its unsophisticated manner of

presentation and interpretations. He applied multivariate discriminant analysis by giving input of set of various financial ratios instead of using simple technique of comparing sequential ratios. He got encouraging results as multivariate analysis gave more forecasting ability (94 per cent of first initial sample with 95 per cent of total firms in both failed and non-failed groups) than comparison of sequential ratios. When accuracy of bankruptcy predictability was investigated it was seen that multivariate model can predict accurately up to two periods and after it predictability diminishes blisteringly. After scrutinizing many ratios Altman select 5 ratios for multivariate analysis which were working capital (W.C) to total assets, retained earnings (R.E) to total assets , EBIT to total assets, MV of equity to total assets and sales to total assets. So, in his model five factors influence the response variable which is called 'Z-score' and it predicted bankruptcy if certain firm's score came in certain range.

#### **2.4.4. Conditional Probability Models (Logit/Probit):**

Logit and probit models are mainly used to predict binary response and binary predictors are used in these models. Discriminant analysis and probability models are different in their assumptions of input like in DA it is assumed that variables are normally distributed and randomly sampled while in case of conditional probability models there is no such requirement for variables. Conditional probability models have value of dependent variable between 1 and 0 so its interpretation is much convenient and comprehensive than discriminant analysis which has range beyond this binary response.

Logit and probit models differ in assumption about the distribution of errors as logit probability functions have standard logistic distribution while probit have standard normal distribution of errors. So, results of both of these models tend to be very same and preferences of researchers regarding use of these models vary by discipline.



Another benefit of logit/probit models over discriminant analysis is that DA requires same no. of companies or other sub-groups as compared to conditional probability models those don't have any such limitation. Ohlson (1980) was the pioneer who use logit model to predict distress risk of US firms by using O-score model which include 9 independent variables as compared to Altman's Z-score under discriminant analysis of 5 variables. Ohlson include set two groups (105 bankrupt and 2,058 non-bankrupt companies) those are not same. Similarly distress risk was also checked by Tan and Dihadjo (2001), and recently Cole and Wu (2009) compared hazard and probit model in predicting bankruptcy prediction of U.S. banks.

## **2.5. Inter-relationship between Value-Glamour, Accrual and Distress Anomalies:**

By looking into ground of these three anomalies, two main tenets of their justifications are found. First is conventional one and based on efficient market hypothesis (EMH) of Fama and French (1992, 1993, and 1996) which explain these anomalous trends as all of these investment strategies, which cause abnormal returns, are basically compensation of risk associated with them individually. While second tenet for justification of these anomalies is behavioral aspect, which demonstrate that not every investor is able to use all information efficiently and due to this lag of rationality investors made errors in expectation (Lakonishok et al., 1994; Dichev, 1998). Behavioral school explains this as investors made huge positive expectations (over-estimate) about stock of low BM, low CFOP, high ACC and low FD but they are surprised in future when face negative abnormal returns due to mean-reversion of returns. Due to this cause earnings of high accrual firms go down in future, growth stocks also move back to their mean path and expectations break-up. Similarly, investing in high FD firms also causes same type of

expectation break-ups as investors put more emphasis solely on profit of firms and ignore share-holder equity or distress conditions of firms.

All of these three anomalies are also tie-in due to given reasons. First, all these anomalies are linked with future stock returns so they may be manifestation of unique underlying phenomenon. Second, value-glamour anomaly may relate to accrual anomaly as it is observed by McNichols (2000) that forecasted growth has positive relation with discretionary accruals. Similarly, accruals are also linked with financial distress of firms and at the same time it may have significant effect on value stocks. So, three interconnected anomalies yield three relationships among them. Third, it is seen in past that research on forecasted returns and their relationship with anomalies is apart by short-term continuation (under-reaction) and medium to long-term reversal of returns (over-reaction) and all of three anomalies are interlinked with reversal of returns or have same ground on which they are connected.

Dechow et al. (1998) shows that there exist strong positive relationship among accruals of the firms and growth of past sales which is used to proxy value-glamour phenomenon. Similarly, Lakonishok et al. (1994) also find out interrelation among value-glamour and accrual anomaly and argue that positive relation exists among them and it is due to over (under) expectations of investors about high value stocks or high accrual stocks. Desai et al. (2004) also find out relationship between accrual and value-glamour stocks and he use high cash flow from operation to price ratio as main proxy for value stocks. His results are supportive to Beaver (2002) that both of these two anomalies share some common attributes.

As that of relationship among accrual and value-glamour anomalies there also present evidence of relationship among value-glamour and distress anomaly. Griffin and Lemmon (2002) find positive relationship between these two anomalies and report that

firms those are in high financial distress and high book to market portfolio gave high stock returns in future. They argue that this arbitrage cannot be explained by only Fama and French (1994) three factor model so they gave mispricing argument that investors have low expectation from stock of high book to market value and high financial distress but due to reversal of returns in future arbitrage can be captured.

Likewise, there also exists relationship among distress and accrual anomalies. As Jeffrey (2005) find evidence that there exist inverse relation among these two anomalies as distress risk decreases systematically across increasing accrual portfolios. Further it is also shown that an abnormal return in future also decreases after controlling portfolios of high distress risk. Zach (2003) also find same evidence of relationship among accrual and distress anomalies and he also find relation of these two anomalies with value-glamour stocks, making relation among all three anomalies. Similarly it is also seen that firms with relatively low accruals have high tendency of delisting so high distress risk (Dechow and Ge, 2005 and Sumway, 2001).

## **Chapter 3**

### **Data and Methodology**

#### **3.1. Data Description:**

This study will start with universe of manufacturing companies listed on Karachi Stock Exchange (KSE) and balance sheet analysis by State Bank of Pakistan will used covering 14 years from 1999 to 2012. As returns of stocks also need to be used for analysis purpose so data of stock prices will be collected from KSE and other sources. In extracting all data of companies for these 14 years about 3 to 4 balance sheet analysis need to consult, and in doing this exercise data of 300 to 340 manufacturing companies will be filtered from raw data as input for further analysis. Companies with negative shareholder's equity will be used as a proxy for financial distress. It is because balance sheet analysis doesn't contain data for delisted companies and another reason of not taking delisted companies for financial distress is that many companies are delisted for the reasons other than financial distress.

Annual data of stock prices (prices of last day of trading) will be used as all other data is also based on annual observations.

#### **3.2. Variable Description:**

Each anomaly includes various variables and here each one is discussed one by one that how it will be calculated. First, for calculation of value-glamour anomaly book and market value of stocks are required and then stock prices of stocks trading on KSE will be used. Book value will be amounted by value of shareholder's equity divided by no. of shares outstanding. Similarly, cash flow from operation to price ratio will also be

derived by CFO deflated by market value of that stock. As CFO in balance sheet analysis for years 1999 to 2002 are not given so they will be calculated by adding depreciation in profit before tax less taxes from it.

Second anomaly is accrual anomaly which will be calculated by total accruals divided by total assets to erase the impact of size of firms. In this case accruals will be derived by cash flow approach as profit before tax minus cash flow from operations. Accruals deflated by market price of the stocks may also be used for accrual anomaly so that different denominators may not impact on results.

Last is financial distress anomaly, for which O-score of distress measure is used as proxy. So, first O-score needs to be derived as Ohlson proposed. For this purpose binary dependent variable regression has to run on following 9 independent variables as in given equation;

$$O - score = \alpha + \beta_1 \cdot Size_{it} + \beta_2 \cdot \frac{TL}{TA}_{it} + \beta_3 \cdot \frac{WC}{TA}_{it} + \beta_4 \cdot \frac{CL}{CA}_{it} + \beta_5 \cdot \frac{NI}{TA}_{it} + \beta_6 \cdot \frac{FU}{TL}_{it} + \beta_7 \cdot INTWO_{it} + \beta_8 \cdot OENEG_{it} + \beta_9 \cdot \frac{(NI_t - NI_{t-1})}{(|NI_t| + |NI_{t-1}|)}_{it}$$

Where abbreviations of variables are described as;

Size: Log of total assets.

TLTA: Total liabilities / Total assets.

WCTA: Working capital divided by total assets.

CLCA: Current liabilities divided by current assets.

OENEG: 1 if Total liabilities > Total assets, otherwise 0.

NITA: Net income / Total assets.

FUTL: Funds provided by operations (CFO) / Total liabilities.

INTWO: 1 if Net income is negative for last 2 years or 0 otherwise.

CHIN:  $(NI_t - NI_{t-1}) / (|NI_t| + |NI_{t-1}|)$ , Change in net income as denominator is used as level indicator, so CHIN measures change in net income.

**Computation of size-adjusted-returns:**

Size-adjusted returns (S.A.R) on the basis of market capitalization will be computed to get control on differences in risk among different portfolios, instead of raw returns. It will be calculated by firstly arranging data in ascending order for market capitalization and S.A.R will be amounted by taking log of current year market prices deflated by previous year's market prices of stocks. In this sense portfolio returns for the next 3 years will be derived to check whether any anomaly gives future abnormal returns or not. To make quintiles divide data of all firms in 5 parts to make portfolio from first quintile (Q1) to fifth quintile (Q5).

### **3.3 Methodology:**

To elaborate methodology for various types of relationships between the three anomalies set theory and regression analysis will be used.

#### **3.3.1 Hedge Strategies:**

Relationships among various anomalies will be tested by adopting portfolio hedge strategies which are zero-investment strategies where position of short is taken and by the proceeds of this short selling long position in another portfolio is adopted simultaneously. So this will be two-dimensional investment strategy. Three tests on the basis of investment hedge strategies are discussed below.

##### **a) Basic Hedge Strategy:**

This trading strategy will show the relationship of two anomalies at the same time which are independent of one another and don't have any common among them. This test checks whether hedging strategy by investing in firms with going long in low CFOP quintile (1<sup>st</sup> quintile) and short it high CFOP quintile (5<sup>th</sup> quintile) gives abnormal future returns or not. Similarly, as BM anomaly give positive future returns by buying stocks of low BM stocks and selling high BM stocks so this study go into hedging by going in long for 5<sup>th</sup> quintile and short for 1<sup>st</sup> quintile. This strategy is also called basic hedge strategy in which abnormal returns of individual anomaly are examined by hedging for extreme quintiles. As for BM and CFOP anomaly, their relation with abnormal returns of next three years are find out by basic hedge strategy, relation of ACC anomaly is also find out by same phenomenon but difference between the two is that for ACC anomaly long strategy for low ACC quintile and short position for high ACC quintile of firms must be adopt because low ACC gives positive and high ACC gives negative future abnormal returns. For last anomaly, distress anomaly, hedging will be like BM or CFOP

anomaly. So, by going long for firms of low FD quintile and short for high FD quintile investor can earn positive future returns. This type of hedging is elaborated by Type 1 relationship in which two anomalies are distinct from each other.

**b) Combined Hedge Strategy:**

This hedging strategy is adopted by investing in two information variables at the same time to earn combined portfolio returns for two anomalies. Combined hedge can be implied by taking short position in low ACC quintile & high BM (high CFOP) quintile and long position in high ACC & low BM (low CFOP) quintile simultaneously. Likewise, combined return strategy for investment in ACC and FD stocks is to take short position in low ACC portfolio of stocks and high FD portfolio, and a long position in high ACC and low FD portfolios at the same time to get positive future abnormal returns. For positive abnormal returns by FD and BM (CFOP) at the same time, investment should be made by going in short for high BM (high CFOP) quintiles and high FD quintile, and long for stocks of low BM (low CFOP) and low FD quintiles at the same time.

**c) Non-Overlapping Hedge Strategy:**

This hedging strategy is adopted by investing in one information variable but at the same time control other information variables. To check whether ACC gives any abnormal returns beyond the BM (CFOP), non-overlapping hedge investment strategy is adopted by going in short position for low ACC quintile stocks which are not in high BM (high CFOP) quintile at the same time and long position for high ACC stocks those are not in low quintile of BM (low CFOP) at that time. Similarly to calculate incremental returns for FD and BM (CFOP) portfolio hedging can be done by taking short position for stocks of high FD quintile which are not present in high BM (high



CFOP) quintiles, simultaneously long position for stocks of low FD those are not present in low BM (low CFOP) quintile. To examine incremental abnormal returns for ACC and FD, investment strategy will be adopted as to take short position in stocks low ACC quintile which are not present in high FD quintile and long position in high ACC quintile which are not apparent in low FD quintile simultaneously.

### **3.3.2. Regression Analysis:**

Cross sectional regression analysis will be used to check whether investor may earn abnormal returns by investing in different strategies. So, all of the independent variables are ACC, ACCP, BM, CFOP and FD for all of three anomalies and their impact will be checked upon 1, 2 and 3 year ahead size-adjusted returns. If coefficients are significant then it shows that abnormal returns can be earned by this anomaly. Step-wise regression analysis will be done for all of these 5 independent variables for 1, 2 and 3 years ahead portfolio for 13 years to check their impact one by one for future returns. In cross sectional data heteroskedasticity may present so robust covariance are used in estimating regression coefficients.

### **3.4. Significance of Returns:**

To check the significance of abnormal returns earned by different investment strategies t-statistics is used which is calculated by using standard errors as proposed by Hansen and Hadrick (1980). And for t-statistics of cross sectional regression average of its absolute values are used for 13 years data so that t-values of different signs don't cancel out their effect.

## Chapter 4

### Results and Discussion

In this section empirical results are reported and discussed. First section contains descriptive statistics of data and correlation matrices. Second section contains the result of O-score which is measured for the proxy of financial distress of the firms. Third section contains results of value-glamour, accrual and distress anomalies for both hedging and regression analysis. Last section has results of overlapping and combined strategies for hedging with all combination of three anomalies and differences in results of two methods are also discussed with it.

#### 4.1. Descriptive Analysis and Correlation:

Descriptive statistics of the data are given as;

**Table 4.1.1: Descriptive Statistics:**

	<b>Mean</b>	<b>Median</b>	<b>Min</b>	<b>Max</b>	<b>Std.Dev.</b>
<b>SAR-1</b>	0.002	-0.02	-3.53	5.15	0.49
<b>SAR-2</b>	0.003	-0.03	-3.79	5.17	0.50
<b>SAR-3</b>	0.003	-0.03	-3.54	5.24	0.51
<b>O-Score</b>	0.58	0.69	0.00	1.00	0.25
<b>BM</b>	0.22	0.16	-11.21	9.32	0.73
<b>CFOP</b>	15.87	3.96	-6248.8	4687.18	239.2
<b>ACCA</b>	0.10	0.05	-6.74	53.05	0.94
<b>ACCP</b>	19.57	3.20	-6571.6	9734.78	321.9
<b>MC</b>	29846	2036.2	8.00	3363450	133801
<b>Size</b>	3.08	3.03	1.01	5.54	0.75
<b>TLTA</b>	0.82	0.62	0.11	80.73	2.30
<b>WCTA</b>	0.60	0.41	0.09	79.73	2.23
<b>CLCA</b>	2.26	1.01	0.14	338.40	11.70
<b>NITA</b>	2.19	0.07	0.01	8038.9	118.44
<b>FUTL</b>	2.24	0.13	0.02	4439.7	70.62

Table 4.1.1 shows the descriptive statistics of all variables used which includes mean, median, minimum value, maximum value and standard deviation of the variables.

While first column consist of variables as follow: Size-adjusted return for 1 year ahead (SAR-1), Size-adjusted return for 2 years ahead (SAR-2), Size-adjusted return for 3 year ahead (SAR-3), O-score (used to measure financial distress), Book to market value (BM), Cash flow to price ratio (CFOP), Accrual over total assets (ACCA), Accrual to price ratio (ACCP), market capitalization (MC), log of total assets (Size), total liabilities to total assets (TLTA), working capital to total assets (WCTA), current liabilities to current assets (CLCA), net income to total assets (NITA) and fund from operation or cash flow from operation to total assets (FUTL).

Mean size-adjusted return of 1 year ahead is 0.002 or 0.2% with median of -0.02, has -3.53 minimum, 5.15 maximum value and standard deviation of 0.49 which is much high as compared to mean. SAR-2 has mean of 0.3%, median of -0.03, minimum value if -3.79, maximum is 5.17 and standard deviation is 0.5. So, median is -0.3% which shows that middle value decline to negative and standard deviation is also approximately equal to SAR-1. SAR-3 also has average of 0.3% value along with median of -0.03, minimum value is -3.54, maximum is 5.24 and standard deviation is 0.51. So, standard deviation of size –adjusted returns increases slightly along with time from first to third year. O-score always has values between 0 and 1 so as its minimum and maximum values are. It has average value of 0.58 with median 0.69 and standard deviation 0.25. Mean value indicates that more companies decline towards financial distress as value of O-score move from 0 to 1 financial distress of the firm also increases.

BM shows book to market value and is interpreted as high book to market ratio show under valuation of stock and low book to market value indicates over valuation of stock. It has mean of 0.22, median is 0.16, minimum value is -11.21, maximum is 9.32 and standard deviation is 0.73. Cash flow to price ratio indicate over or under valuation of

stock is comparison to other stock or market indices. If cash flow to price ratio is high means that stock is undervalued other overvalued. CFOP has mean value of 15.87, median is 3.96, minimum value is -6248.8 and maximum value is 4687.18 with standard deviation of 239.2. Next is accrual to total asset ratio which has mean of 0.1, median of 0.05, minimum value is -6.74 and maximum value is 53.05 with standard deviation of 0.94. Accrual to price ratio has mean of 19.57 which is much larger than accrual to total assets because of different devisors. ACCP has median of 3.2, minimum values is -6571.6 and maximum is 9734.78 with standard deviation of 321.9.

Market capitalization has a mean of 29846 million rupees with median of 2036.2, minimum value is 8 and maximum is 3363450 with standard deviation of 133801. Size has average of 3.08, median is 3.03, minimum value is 1.01, maximum is 5.54 and standard deviation is 0.75. Total liabilities to total asset ratio (TLTA) has average value of 0.82, median is 0.62, minimum value is 0.11 and maximum is 80.73 with standard deviation 2.30. Working capital to total asset ratio (WCTA) has mean value of 0.60, median 0.41, minimum amount is 0.09 and maximum is 7973 with standard deviation of 2.23. Current liabilities to current assets ratio has average value of 2.26 , median is 1.01, minimum value is 0.14, maximum value is 338.4 and standard deviation of 11.70.

Net income to total asset ratio has average value of 2.19 , with median of 0.07, has minimum value of 0.01 and maximum of 8038.9 with standard deviation 118.44. Likewise fund from operation to total liabilities (cash flow from operations to total liabilities) has average of 2.24, median is 0.13, minimum value is 0.02, maximum value is 4439.75 and standard deviation of 70.62.

Table 4.1.2 and 4.1.3 shows two correlation matrices. First correlation matrix is for all the three anomalies and size-adjusted returns while table 4.1.3 shows correlation

among variables used in calculating o-score which is measure of financial distress.

Correlation matrices are given as;

**Table 4.1.2: Correlation matrix for size-adjusted returns and anomalies:**

	SAR-1	SAR-2	SAR-3	O-Score	BM	CFOP	ACCA	ACCP	MC
SAR-1	1.000								
SAR-2	-0.101	1.000							
SAR-3	-0.094	-0.082	1.000						
O-Score	0.011	0.008	-0.013	1.000					
BM	0.003	-0.021	0.014	0.158	1.000				
CFOP	-0.003	-0.011	-0.012	0.108	0.041	1.000			
ACCA	0.007	-0.004	-0.022	0.037	0.012	-0.023	1.000		
ACCP	-0.013	-0.008	0.015	-0.006	0.026	-0.543	0.221	1.000	
MC	-0.028	0.026	0.019	0.012	-0.017	0.005	0.001	-0.007	1.000

**Table 4.1.3: Correlation matrix for O-score variables:**

	Size	TLTA	WCTA	CLCA	NITA	FUTL
Size	1.000					
TLTA	-0.349	1.000				
WCTA	-0.292	0.650	1.000			
CLCA	-0.145	0.133	0.108	1.000		
NITA	-0.085	0.238	0.239	0.001	1.000	
FUTL	-0.031	-0.005	0.029	-0.004	0.011	1.000

Table 4.1.2 shows correlation among proxies of different anomalies and size-adjusted returns. Correlation shows how two variables move along each other and what type of relationship exist between them, either positive or negative. Value of correlation is interpreted in percentage and generally value greater than 0.8 is assumed to be highly correlated which means that two variables have some same feature which causes strong relationship among them and it may not be good for further analysis. Maximum value of correlation is among ACCP and CFOP ratios which is -0.543 which shows that these two variables have negative relation with each other if one variable increases other

variable will decrease. And these two variables have 54.3% negative correlation among them which is highest among all variables.

Size-adjusted returns of one year ahead have highest negative correlation with size-adjusted returns of second and third years which have values of 10.1 and 9.4 percent. Similarly size-adjusted return of two year ahead has negative correlation of 8.2% with third year future size-adjusted return and with other variables it has low correlation. All other variables have very low correlation among them except correlation between ACCP and CFOP which is -54.3% and ACCP and ACCA which is 22.1%.

Table 4.1.3 contains correlation among variables those are used to calculate financial distress by O-score. In measuring O-score Correlation between size (log of total asset) and TLTA (total liabilities to total assets) is -34.9% which is highest correlation of size with all other variables. Second column shows the correlation of TLTA with other variable among which correlation with WCTA (working capital to total assets) has highest value of 65% and has minimum correlation with FUTL (cash flows from operations to total liabilities) with value of -0.5%.

Third column shows correlation of WCTA with various variables among which it has highest correlation of 23.9% with NITA (net income to total assets) and then CLCA (current liabilities to current assets) with value of 10.8%. Similarly CLCA has correlation value of 0.1% and -0.4% with NITA and FUTL respectively and in the end correlation of NITA with FUTL is 1.1% indicating that all have correlation values of less than 80% so there is no major problem of correlation among these variables to compute O-score.

#### 4.1.2. Results of O-score:

Apart from value-glamour and accrual anomalies to measure distress anomaly O-score is calculated in reference to Ohlson (1980). Its equation is given as;

$$O - score = \alpha + \beta_1 \cdot Size_{it} + \beta_2 \cdot \frac{TL}{TA}_{it} + \beta_3 \cdot \frac{WC}{TA}_{it} + \beta_4 \cdot \frac{CL}{CA}_{it} + \beta_5 \cdot \frac{NI}{TA}_{it} + \beta_6 \cdot \frac{FU}{TL}_{it} + \beta_7 \cdot INTWO_{it} + \beta_8 \cdot OENEG_{it} + \beta_9 \cdot \frac{(NI_t - NI_{t-1})}{(|NI_t| + |NI_{t-1}|)}_{it}$$

Descriptive statistics of model's independent variables are discussed in previous section. It includes 3 dummy variables and has range between 0 and 1. Higher the value of O-score higher will be the tendency of the firm to be in financial distress. Result of this panel regression is given in table 4.1.4.

**Table 4.1.4: Results for O-score:**

<b>ML-Binary Logit</b>			
<b>Variables</b>	<b>Coefficients</b>	<b>Std. Error</b>	<b>Prob.</b>
<b>Size</b>	-0.4255	0.0636	0.0000
<b>TLTA</b>	-0.1819	0.2446	0.4179
<b>WCTA</b>	0.2089	0.2161	0.3338
<b>CLCA</b>	0.2778	0.0433	0.0000
<b>NITA</b>	0.0009	0.0008	0.2718
<b>FUTL</b>	-0.0661	0.0230	0.0042
<b>INTWO</b>	1.8876	0.1013	0.0027
<b>OENEG</b>	2.1465	0.1959	0.0018
<b>CHIN</b>	0.1378	0.1620	0.3951
Obs with +ve Equity = 2260		Total Obs = 3900	
Obs with -ve Equity = 1640			

Here dependent variable is dummy variable whose value is 0 for the firm with positive equity and 1 for the firm with negative shareholder equity. It can be seen from the table above that among 9 independent variables five variables are statistically significant which have their p-value less than 0.05 or significant at 5% confidence level.

Heteroskedasticity is removed by using consistent coefficient covariance. First variable is size which is high significant as its p-value is 0.000 and standard error is 0.063 which is also low. It has negative relation with the financial distress of the firm as higher the value of O-score lower will be the size of the firm so, this shows that the firms of relatively lower size have higher financial risk as compared to large firms based of their assets. Value of coefficient of size is -0.4255 which means by increase in size of the firm by 1% the financial distress of the firm will decrease by 42.55%. So, larger the size of the firm lower will be its risk of financial distress.

TLTA and WCTA have p-value much greater than 0.05 so these variables don't have any significant impact on the financial position of the firm and these variables are insignificant so their coefficients also don't need to be explained. Current liabilities to current asset ratio (CLCA) has p-value of 0.0 which shows it is highly significant and has standard error of 0.0433 with positive coefficient of 0.2778. Positive coefficient shows that as value of O-score of the company rises the value of current liabilities as compared to current assets also rises so higher the financial distress of the company higher will be the value of this ratio. Coefficient of is interpreted as 1% increase in CLCA ratio will tend to increase financial distress of the firm by 27.78%.

NITA is net income to total asset ratio which has p-value of 0.2718 so, it is highly insignificant that mean by changing NITA there would not be any significant change in financial distress of the firm. FUTL is funds from operations to total asset ratio and it has p-value of 0.0042 which is significant at 5% level and has standard error of 0.0230 with coefficient of -0.0661. Its coefficient shows that by 1% increase in FUTL the financial distress of the firm will decrease by 6.61 % which is supportive by theory that as cash flow from operation increases riskiness of firm to be in financial distress zone decreases. INTWO is the dummy variable which has value of 1 if net income is negative



for the last two years otherwise 0. Its p-value is 0.0027 which is highly significant and coefficient has positive value of 1.8876 which shows that by the firms with negative equity for last two years give rise to financial distress as greater value of O-score. And standard error of INTWO is 0.1013 which is relatively high as compared to other variables.

OENEG is also a dummy variable which has value of 1 if total liabilities are greater than total assets otherwise 0. Its p-value is 0.0018 which is also significant with standard error of 0.1959 and coefficient is 2.1465. Sign of coefficient is positive which shows that if total liabilities of the firm are greater than total assets than it will have very high tendency to be in financial distress zone or value of its O-score will be high. CHIN measures change in net income as compared to period but its p-value is 0.3951 which is very high and insignificant. So, it does not have any significant impact on financial distress of the firm.

## **4.2. Results for Single Anomaly with Hedging and Regression Analysis:**

In this section result of value-glamour, accrual and financial distress anomalies are given and discussed separately. Tables contain results of both hedging and regression approach so that differences in abnormal returns by both of these techniques can be seen easily.

### **4.2.1. Value-Glamour Anomaly:**

Two proxies are used for value-glamour anomalies which are book to market and cash flow from operation to price ratio. Firstly results of book to market ratio as a value-glamour anomaly is reported where strategy used in quintiles are made on the basis of market capitalization and each portfolio contains 20% of the total stocks. Firms are

arranged in ascending order with respect to book to market value which means that first quintile contains stocks of lowest book to market value and fifth quintile contains stocks of highest book to market value.

Hedging strategy used here is based on the mispricing argument that investors sell stocks of high book to market value as these are undervalued stocks but when stock prices move again towards mean and there is boom in the future then investors can get arbitrage by going long in stocks of firms with high BM value and short for the firms with low BM value. So, size-adjusted returns of first quintile are deducted from size-adjusted returns of fifth quintile to see whether there is any tendency to earn abnormal returns or not.

In table 4.2.1 steric shows the level of significance of returns as 10 percent (\*), 5% (\*\*), and 10% (\*\*\*) level of significance. Book to market anomaly has significant one year ahead return are 10.3% and they are significant at 5% level while abnormal returns for two years ahead book to market anomaly are 3.3% and it is significant at 10% level but abnormal returns in third year in future are only 1.02% which is not significant even at 10% level. So, by going into hedge strategy of going short for the firms having low book to market value and long for the firms which have high book to market value investors can get arbitrage for first and second year but may not earn significant returns in third year in future. But if we see abnormal return of regression analysis it is clear that abnormal returns are not earned in accordance to regression approach as BM don't have significant coefficient in all three years. It is shown in first column of regression analysis and has t-value of 1.642 for market capitalization but as intercept and book to market ratio is not significant so abnormal returns may not be earned.

**Table 4.2.1: Result for Value-Glamour anomaly considering BM as a proxy.**

<b>Panel A: BM-Quintile Analysis</b>							
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q5-Q1</b>	<b>t-value</b>
<b>BM</b>	-0.359	0.086	0.160	0.282	0.868		
<b>SAR-1</b>	-0.036	-0.012	-0.024	0.017	0.067	0.103**	(-5.471)
<b>SAR-2</b>	0.002	-0.018	-0.002	-0.005	0.036	0.033*	(-3.425)
<b>SAR-3</b>	0.008	-0.011	-0.010	0.006	0.019	0.010	(-1.312)
<b>Panel A: Regression Approach</b>							
<b>Dependent Variable</b>	<b>Independent Variables</b>						
	<b>Intercept</b>	<b>BM</b>	<b>MC</b>				
<b>SAR-1</b>	-0.007 (0.716)	0.060 (1.227)	-0.001* (1.642)				
<b>SAR-2</b>	-0.004 (0.418)	0.004 (0.938)	0.006 (0.838)				
<b>SAR-3</b>	0.001 (0.279)	-0.005 (0.939)	0.017 (0.535)				

These results are somehow different from Taylor (2011) as significant abnormal returns for two and three year ahead portfolio but not for one year ahead portfolio and this difference in time period of earning abnormal returns may be due to perception of investors or due to relatively large time period of return reversal towards their mean value. Similarly results of regression analysis are also different as comparison to Desai et al. (2004) as they find significant abnormal returns for one year ahead portfolios of book to market ratio but in case of KSE regression analysis don't gives any significant abnormal returns for BM anomaly.

**Table 4.2.2: Result for Value-Glamour anomaly considering CFOP as a proxy.**

<b>Panel A: CFOP-Quintile</b>							
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q5-Q1</b>	<b>t-value</b>
<b>CFOP</b>	-62.992	0.868	3.886	10.213	115.269		
<b>SAR-1</b>	-0.088	-0.048	0.008	0.029	0.111	0.200**	(-5.760)
<b>SAR-2</b>	0.002	-0.042	0.012	0.005	0.036	0.034*	(-2.447)
<b>SAR-3</b>	0.017	-0.036	0.011	0.017	0.003	-0.013	(1.613)
<b>Panel B: Regression Approach</b>							
<b>Dependent Variable</b>	<b>Independent Variables</b>						
	<b>Intercept</b>	<b>CFOP</b>	<b>MC</b>				
<b>SAR-1</b>	0.002 (0.337)	0.001* (1.508)	0.0001 (1.34)				
<b>SAR-2</b>	0.001 (0.313)	-0.002 (1.409)	0.005 (0.079)				
<b>SAR-3</b>	0.007 (0.233)	0.0013 (1.170)	0.0061 (0.072)				

Now result for value-glamour anomaly by taking cash flow to market price ratio as a proxy for value-glamour is discussed. Hedging strategy used here is also based on the mispricing argument that investors sell stocks of high cash flow to price ratio as these are undervalued stocks but when stock prices revert towards mean and there is boom in the future then investors can get arbitrage by going long in stocks of firms with high CFOP value and short for the firms with low CFOP value. So, size-adjusted returns of first quintile are deducted from size-adjusted returns of fifth quintile to see whether there is any tendency to earn abnormal returns or not.

Table 4.2.2 shows results of abnormal returns by considering only cash flow to price anomaly for hedging and regression analysis. Panel A contains the result of hedging strategy which shows that abnormal returns of 20% can be earned in one year ahead and

are significant at 5% level while abnormal returns from two years ahead stock portfolios are 3.4% which is significant at 10% level but three year ahead portfolio don't gives any significant abnormal returns. These results are consistent with Taylor (2011) who also find that abnormal returns can be earned for one, two and three year future portfolios but in case of KSE abnormal returns for CFOP by hedging strategy cannot be earned.

Regression analysis shows that significant abnormal returns of 0.1% can be earned for by CFOP only for one year ahead portfolios but not for two and three year future stock returns. These results are also consistent with Desai et al. (2004) as they also find significant abnormal returns for CFOP.

#### **4.2.2 Accrual Anomaly:**

Accrual anomaly is also analysed by taking two proxies in consideration. One is accrual to total assets ratio and second is accrual to market price ratio. The difference between these two proxies is only of their denominator as in accrual to total asset (ACCA) accruals are divided by total assets to remove the impact of size for firms and in accrual to market price (ACCP) accruals are divided by market price of the share of the firm to check whether there is any difference in earning abnormal returns in comparison to other anomalies as all other are also denominator of market price. Accruals are calculated according to cash flow method as deducting cash flows from operations from earnings before interest and taxes.

Firstly results of ACCA are discussed in table 4.2.3 where results of hedge strategy and regression analysis are reported. Hedging strategy is used in accordance to mispricing theory that investors undervalue the stocks of low accruals but in future as prices of these stocks revert towards their mean value so abnormal returns can be earned by going long for the stocks with low accrual to total asset value and short for the stock

with high accrual to total asset value. So, portfolios are made on the basis of accruals and to measure abnormal returns size-adjusted returns of fifth (highest) portfolio are deducted from first (lowest) portfolio.

**Table 4.2.3: Result for Accrual anomaly taking ACCA as a proxy.**

<b>Panel A: ACCA-Quintile</b>							
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q1-Q5</b>	<b>t-value</b>
<b>ACCA</b>	-0.100	0.021	0.057	0.107	0.467		
<b>SAR-1</b>	-0.010	0.002	-0.011	-0.013	0.044	-0.054**	(5.213)
<b>SAR-2</b>	0.028	-0.019	0.001	-0.043	0.046	-0.018	(1.325)
<b>SAR-3</b>	-0.017	0.004	0.007	-0.017	0.035	-0.052**	(5.629)
<b>Panel B: Regression Approach</b>							
<b>Dependent Variable</b>	<b>Independent Variables</b>						
	<b>Intercept</b>	<b>ACCA</b>	<b>MC</b>				
<b>SAR-1</b>	-0.006 (0.420)	0.133 (1.010)	-0.000 (0.0039)				
<b>SAR-2</b>	-0.004 (0.462)	0.128 (1.288)	0.000 (0.0864)				
<b>SAR-3</b>	-0.006 (0.480)	0.151 (1.204)	0.004 (-0.002)				

Table 4.2.3 contains results of size-adjusted 1, 2 and 3 year future returns for hedge portfolios as well as regression analysis. In panel A results for hedge portfolios are given for ACCA and steric shows the level of significance based on the t-value. According to significance of abnormal returns it is clear that abnormal returns can be earned for first and third year after the time of formation of portfolios. SAR-1 gives negative abnormal returns of 5.4% with t-value of 5.213 and SAR-3 gives negative abnormal returns of 5.2% with t-value of 5.629. Negative abnormal returns means that expected returns of the portfolio are less than actual returns. Whereas Desai et al. (2004) also show that positive abnormal returns can be earned for 1 year ahead size-adjusted returns but they don't analyse the returns for second and third year ahead size-adjusted

returns. Similarly Taylor (2011) also find that positive abnormal returns can be earned for ACCA for first, second and third year in the future. It shows that in case of KSE accrual anomaly does not exist by taking ACCA as a proxy but it may possible that it exist while controlling other anomalies like value-glamour or distress.

**Table 4.2.4: Result for Accrual anomaly taking ACCP as a proxy.**

<b>Panel A: ACCP-Quintile</b>							
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Q1-Q5</b>	<b>t-value</b>
<b>ACCP</b>	-60.810	0.952	4.168	11.447	127.266		
<b>SAR-1</b>	0.004	-0.040	-0.002	0.033	0.017	-0.012	(1.186)
<b>SAR-2</b>	0.004	0.003	-0.010	-0.015	0.031	-0.026**	(3.656)
<b>SAR-3</b>	-0.008	-0.019	-0.021	-0.0002	0.063	-0.071**	(4.746)
<b>Panel B: Regression Approach</b>							
<b>Dependent Variable</b>	<b>Independent Variables</b>						
	<b>Intercept</b>	<b>ACCP</b>	<b>MC</b>				
<b>SAR-1</b>	0.0001 (0.293)	0.0001 (1.372)	0.0012 (1.52)				
<b>SAR-2</b>	0.001 (0.292)	-0.0001 (1.399)	0.002 (0.098)				
<b>SAR-3</b>	0.001 (0.200)	-0.002* (1.661)	0.0023 (0.056)				

Secondly results of ACCP are discussed in table 4.2.4 where results of hedge strategy and regression analysis are reported. Hedging strategy is used in accordance to mispricing theory that investors undervalue the stocks of low accruals but in future as prices of these stocks revert towards their mean value so abnormal returns can be earned by going long for the stocks with low accrual to market price ratio and short for the stock with high accrual to market price ratio. So, portfolios are made on the basis of

accruals and to measure abnormal returns size-adjusted returns of fifth (highest) portfolio are deducted from first (lowest) portfolio.

Panel A of the table 4.2.4 describe the abnormal returns for hedging and it is seen that although significant negative abnormal returns of 2.6% and 7.1% are earned in second and third year but positive returns are not earned which shows non-presence of accrual anomaly if ACCP is used as a proxy. While Taylor (2011) find significant abnormal returns for accrual anomaly independently for all three years in the future but in case of KSE accrual anomaly does not give positive future abnormal returns. Similarly if we see panel B of the table 4.2.4 it is clear that negative abnormal returns of 0.2% are earned for third year by regression approach and these results are similar to Desai (2004) who also find negative abnormal returns for first year. Jawad and Javaid (2015) find that positive abnormal returns can be earned by going short for high accrual portfolio and long for low accrual portfolio but this difference of returns may exist due to different method for measuring accruals. As Jawad and Javaid (2015) measure accruals on the basis of balance sheet approach but here accruals are measured by cash flow method and this difference of measuring approach may cause difference in results. As accrual anomaly does not give positive future abnormal returns but it may possible that this strategy is useful if we control impact of other variables like financial distress, sales growth, earnings, book to market value, cash flow to price ratio etc.

#### **4.2.2 Distress Anomaly:**

Financial distress anomaly works like value-glamour anomaly where stocks of high financial distress are sold out under the perception that these stocks are under distress and will not give significant returns but in the future with the mean reversion of the returns these stocks give abnormal returns. This argument is supported by mispricing argument which shows due to mispricing investors can earn significant positive



abnormal returns in future. So, size-adjusted returns of the firms are arranged in ascending order with respect to their O-score. On the basis of mispricing theory, strategy used for financial distress anomaly is to go long for the stocks of high financial distress and short for the stocks of the firms with low financial distress. In this sense size-adjusted returns of first portfolio are deducted from fifth portfolio's returns.

**Table 4.2.5: Result for Financial Distress anomaly taking FD as a proxy.**

<b>Panel A: FD-Quintile</b>							
	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q5-Q1</b>	<b>t-value</b>
<b>FD</b>	0.160	0.529	0.696	0.744	0.811		
<b>SAR-1</b>	-0.054	-0.001	0.012	0.018	0.037	0.091**	(-5.751)
<b>SAR-2</b>	0.027	-0.016	-0.009	-0.006	0.019	-0.007	(1.144)
<b>SAR-3</b>	0.021	-0.006	-0.007	-0.005	0.010	-0.010	(2.319)
<b>Panel B: Regression Approach</b>							
<b>Dependent Variable</b>	<b>Independent Variables</b>						
	<b>Intercept</b>	<b>FD</b>	<b>MC</b>				
<b>SAR-1</b>	-0.068 (1.200)	0.119 (1.291)	-0.006 (1.230)				
<b>SAR-2</b>	0.026 (0.931)	-0.042 (0.972)	0.015 (0.073)				
<b>SAR-3</b>	0.022 (1.115)	-0.037 (1.236)	0.0213 (0.541)				

Results of hedging strategy and cross sectional regression analysis are given in the table 4.2.5. Panel A shows abnormal returns of distress anomaly and it can be seen that only in one year after formation of portfolio the positive abnormal returns of 9.1% are earned at 5% level. While abnormal returns after 2 and 3 years of formations portfolios are not earned. Which means that arbitrage can be captured by going short for lowest distress stock and long for highest distress stock for only first year after formation of portfolios. These results are consistent with Zaretzky and Zumwalt (2014) as they also explain that

high distress stocks tend to give high returns. Similarly, regression results elaborate that significant abnormal returns are not earned for all of three years for distress anomaly but it is seen that abnormal returns of 11.9% in first year after formation of portfolio are statistically significant as compare to other years. Distress anomaly may give significant positive abnormal returns by taking into control other anomalies and this is discussed later.

### **4.3. Results of Combined and Non-overlapping Hedge Strategy:**

After discussing abnormal returns for each of three anomalies for their various proxies individually, now combined and non-overlapping future abnormal returns are discussed for combination of these three anomalies. Combined hedging includes the stocks which are present in both portfolios after arranging according to specific strategy. Similarly, non-overlapping returns are calculated by stocks of one portfolio which are not present in other portfolio where both portfolios are arranged with respect to different anomalies. Results of regression analysis are also mentioned with hedge portfolios to see the difference in results of both methodologies. Here result for only combined portfolios are given under regression analysis as returns of single anomaly are given with individual anomaly results in previous section.

#### **4.3.1 Combined and Non-overlapping Returns for ACCA and BM:**

Value-glamour and accrual anomalies are tested to see that whether combined returns and returns for single anomaly, by controlling other, are significant or not. Firstly ACCA is taken as the proxy for accrual anomaly and BM for value-glamour anomaly. Hedging strategies used for this purpose are according to mispricing theory and same as for individual anomalies but the difference here is that we treat two anomalies at the

same time. With hedging strategies results for regression analysis are also given for ACCA and BM.

Table 4.3.1 contains combined and non-overlapping hedging as well as regression results for ACCA and BM. In reference to individual hedge strategies, portfolios of long and short position for ACCA and BM are adopted. As short position was taken for highest accrual and lowest value-glamour portfolios, on the basis of perception of investors, here short position is taken for both of these anomalies at a same time. So, short for fifth ACCA and first BM portfolio is taken. Similarly, long position is taken for lowest ACCA and highest BM portfolio. Firstly results for combined hedge returns are given which shows that abnormal returns of 11.3% for two year future portfolio are earned with significance level of 10%. While abnormal returns are not significant for first year and third year. The difference of returns between combined hedge and ACCA shows significant positive future returns of 2.2% for SAR-3 which means that returns for combined portfolio are 2.2% more than individual ACCA anomaly. Similarly difference of returns between combined hedge and BM shows significant negative future returns of 1% for SAR-1.

Second part of panel A of table 4.3.1 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short position is taken for the stocks those are in highest ACCA portfolio but not in lowest BM portfolio at the same time. Long position is taken for stocks of first ACCA portfolio stocks which are not in fifth BM portfolio simultaneously. Then combined returns for non-overlapping hedge strategy for ACCA are given which gives significant abnormal returns of 6.5% for SAR-2 at 10% level of significance. But one and three year future returns are not significant for non-overlap hedge portfolios of ACCA.

**Table 4.3.1: Results of ACCA and BM combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCA and BM by Hedging</b>				
<b>Return for combined hedge on ACCA and BM</b>	<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>	
Short-sell firms simultaneously in 5th ACCA & 1st BM quintile	-0.012	0.055	0.044	
Buy firms simultaneously in 1st ACCA & 5th BM quintile	0.102	0.058	-0.074	
Combined Return of ACCA and BM	0.089 (-0.775)	0.113* (-4.833)	-0.029 (0.251)	
Difference b/w combined hedge and basic ACCA hedge returns	0.143 (-1.759)	0.132 (-1.279)	0.022** (5.687)	
Difference b/w combined hedge and basic BM hedge return	-0.01*** (15.311)	0.079 (-0.152)	-0.040 (1.511)	
<b>Return for Non-overlap hedge for ACCA and BM</b>				
Short firms in 5th ACCA but not in 1st BM at same time	0.079	0.042	0.027	
Buy firms in 1st ACCA but not in 5th BM at same time	-0.040	0.023	-0.006	
Non-overlap hedge return for ACCA	0.039 (-0.325)	0.065* (-3.530)	0.020 (-0.604)	
Difference b/w non-overlap and basic hedge return for ACCA	0.093* (-2.166)	0.084 (-1.438)	0.072* (-2.437)	
Short firms in 1st BM but not simultaneously in 5th ACCA	-0.050	-0.025	-0.011	
Buy firms in 5th BM but not simultaneously in 1st ACCA Quint.	0.059	0.0330	0.035	
Non-overlap hedge return for BM	0.008 (-0.079)	0.007 (-0.119)	0.024 (-0.508)	
Difference b/w non-overlap and basic hedge return for BM	-0.095 (0.203)	-0.026 (0.137)	0.013*** (-17.87)	
<b>Panel B: Tests on relations between ACCA and BM by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCA</b>	<b>BM</b>	<b>MC</b>
<b>SAR-1</b>	-0.017 (0.810)	0.146 (1.057)	0.062 (1.226)	-0.008* (1.62)
<b>SAR-2</b>	-0.006 (0.437)	0.138 (1.284)	0.007 (0.911)	0.002 (0.087)
<b>SAR-3</b>	-0.007 (0.488)	0.161 (1.221)	-0.007 (0.861)	0.003 (0.058)

Difference between non-overlap and individual hedge returns for ACCA are also given which shows that abnormal returns are significant for first and third year after formation of portfolios. So, one year a head significant non-overlapping abnormal return are 9.3% and three year a head non-overlapping return are 7.2% more than basic ACCA hedge.

Similarly to calculate non-overlapping hedge returns of BM anomaly after controlling ACCA we take short for lowest BM stocks which are not in highest ACCA portfolio at the same time and long for highest BM stocks those are not in lowest ACCA portfolio. Non-overlapping hedge returns for BM anomaly after controlling ACCA are not significant for all of the three years but difference of non-lapping hedge from basic BM hedge returns is significant for third year and it may be due to relatively low returns of basic BM hedge. Results for combined and non-overlapping hedge returns are supported by Taylor (2011) but also have some difference as Taylor find significant returns for non-overlap hedge for ACCA for all of three years and relatively high returns are earned in NYSE as compared to KSE. This difference in returns shows the difference in perception of investors and way of investing in these markets.

Panel B of table 4.3.1 shows the combined results of regression analysis for BM and ACCA. Individual returns for ACCA and BM are given in previous section of this chapter so here only combined regression results are given which shows that no significant abnormal returns for ACCA and BM are earned. But it is seen that BM for SAR-1 and ACCA for SAR-2 gives statistically significant abnormal returns relative to other variables. Statistical significance or relative t-value are consider here due to difference in hedge strategy and regression analysis as in first one extreme portfolios are taken to calculate abnormal returns but in later one whole series is considered.

#### **4.3.2. Combined and Non-overlap Return Results of ACCA and CFOP.**

After BM as a proxy for value-glamour anomaly now combined and non-overlapping returns are discussed by taking CFOP proxy for value-glamour anomaly. Hedging strategies used for this purpose are according to mispricing theory and same as for individual anomalies but the difference here is that we treat two anomalies at the same

time. With hedging strategies results for regression analysis are also given for ACCA and CFOP.

Table 4.3.2 contains combined and non-overlapping hedging as well as regression results for ACCA and CFOP. In reference to individual hedge strategies, portfolios of long and short position for ACCA and CFOP are adopted. As short position was taken for highest accrual and lowest value-glamour portfolios, on the basis of perception of investors, here short position is taken for both of these anomalies at a same time. So, short for fifth ACCA and first CFOP portfolio is taken. Similarly, long position is taken for lowest ACCA and highest CFOP portfolio. Firstly results for combined hedge returns are given which shows that significant abnormal returns are not earned for this combined strategy. The difference of returns between combined hedge and ACCA shows significant positive future returns of 4.2% for SAR-1 and 8.5% for SAR-3 which means that returns for combined portfolio are 4.2% and 8.5% more than individual ACCA anomaly for SAR-1 and SAR-3 respectively. Similarly difference of returns between combined hedge and CFOP shows significant negative future returns of 21.1% for SAR-1. But difference of returns between combined hedge and CFOP future abnormal returns are not significant for SAR-2 and SAR-3.

Second part of panel A of table 4.3.2 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short position is taken for the stocks those are in highest ACCA portfolio but not in lowest CFOP portfolio at the same time. Long position is taken for stocks of first ACCA portfolio stocks which are not in fifth CFOP portfolio simultaneously. Then combined returns for non-overlapping hedge strategy for ACCA are given but this does not gives significant abnormal returns. Difference between non-overlap and individual hedge returns for ACCA are also given which shows that abnormal returns are

significant for first and third year after formation of portfolios. So, one year a head significant non-overlapping abnormal return are 9.7% and three year a head non-overlapping return are 5.8% in excess to basic ACCA hedge.

Similarly to calculate non-overlapping hedge returns of CFOP anomaly after controlling ACCA we take short for lowest CFOP stocks which are not in highest ACCA portfolio at the same time and long for highest CFOP stocks those are not in lowest ACCA portfolio. Non-overlapping hedge returns for CFOP anomaly after controlling ACCA are not significant for all of the three years but difference of non-overlapping hedge from basic CFOP hedge returns is significant for all three years and it may be due to relatively low returns of basic CFOPP hedge. Results for combined and non-overlapping hedge returns are supported by Desai et al. (2004) but also have some difference as they don't find significant returns for non-overlap hedge for ACCA. This difference in returns shows the difference in perception of investors and way of investing in these markets.

Panel B of table 4.3.2 shows the combined results of regression analysis for CFOP and ACCA. Individual returns for ACCA and CFOP are already shown in last section of this chapter so here only combined regression results are given which shows that no significant abnormal returns for ACCA and CFOP are earned. But it is seen that CFOP for SAR-1 and ACCA for SAR-2 gives statistically significant abnormal returns relative to other variables. Statistical significance or relative t-value are consider here due to difference in hedge strategy and regression analysis as in first one extreme portfolios are taken to calculate abnormal returns but in later one whole series is considered. And market capitalization is used here as control variable which has statistically significant for one year future size-adjusted returns.

**Table 4.3.2: Results of ACCA and CFOP combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCA and CFOP by Hedging</b>				
<b>Return for combined hedge on ACCA and CFOP</b>		<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>
Short firms simultaneously in 5th ACCA & 1st CFOP quintile		-0.055	0.021	0.027
Buy firms simultaneously in 1st ACCA & 5th CFOP quintile		0.043	0.105	0.005
Combined Return of ACCA and CFOP		-0.011 (0.120)	0.127 (-1.50)	0.033 (-1.52)
Difference b/w combined hedge and basic ACCA hedge return		0.042* (-3.557)	0.145 (-1.25)	0.085* (-2.22)
Difference b/w combined hedge and basic CFOP hedge return		-0.212* (2.887)	0.093 (-0.26)	0.047 (-1.59)
<b>Return for Non-overlap hedge for ACCA and CFOP</b>				
Short firms in 5th ACCA but not simultaneously in 1st CFOP		0.080	0.052	0.038
Buy firms in 1st ACCA but not simultaneously in 5th CFOP		-0.037	-0.013	-0.032
Non-overlap hedge return for ACCA		0.043 (-0.367)	0.039 (-0.59)	0.005 (-0.08)
Difference b/w non-overlap and basic hedge return for ACCA		0.097* (-2.116)	0.057 (-1.64)	0.058* (-2.79)
Short-sell firms in 1st CFOP but not simultaneously in 5th ACCA		-0.099	-0.005	0.013
Buy firms in 5th CFOP but not simultaneously in 1st ACCA		0.149	-0.010	0.001
Non-overlap hedge return for CFOP		0.050 (-0.20)	-0.005 (1.203)	0.014 (-1.17)
Difference b/w non-overlap and basic hedge return for CFOP		-0.150* (3.113)	-0.039* (5.381)	0.028* (-3.11)
<b>Panel B: Tests on relations between ACCA and CFOP by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCA</b>	<b>CFOP</b>	<b>MC</b>
<b>SAR-1</b>	-0.007 (0.433)	0.143 (1.083)	0.001 (1.445)	-0.002 (1.450)
<b>SAR-2</b>	-0.005 (0.438)	0.135 (1.284)	0.003 (1.234)	-0.004 (0.826)
<b>SAR-3</b>	-0.008 (0.464)	0.158 (1.153)	0.0057 (1.173)	-0.033 (0.625)



### **4.3.3 Combined and Non-overlap Return Results for ACCA and FD:**

Accrual and distress anomalies are tested to see that whether combined returns and returns for single anomaly, by controlling other, are significant or not. Firstly ACCA is taken as the proxy for accrual anomaly and O-score for financial distress (FD) anomaly. Hedging strategies used for this purpose are according to mispricing theory and same as for individual anomalies but the difference here is that we treat two anomalies at the same time. With hedging strategies results for regression analysis are also given for ACCA and FD.

Table 4.3.3 contains combined and non-overlapping hedging as well as regression results for ACCA and FD. In reference to individual hedge strategies, portfolios of long and short position for ACCA and FD are adopted. As short position was taken for highest accrual and lowest financial distress portfolios, on the basis of perception of investors, here short position is taken for both of these anomalies at a same time. So, short for fifth ACCA and first FD portfolio is taken. Similarly, long position is taken for lowest ACCA and highest FD portfolio. Firstly results for combined hedge returns are given which shows that abnormal returns of 7.0% for two year future portfolio are earned with significance level of 10%. While abnormal returns are not significant for first year and third year. The difference of returns between combined hedge and ACCA shows significant positive future returns of 1.7% at 5 percent level for SAR-3. It means that returns for combined portfolio are 1.7% more than individual ACCA anomaly for SAR-3. Similarly difference of returns between combined hedge and FD shows significant negative future returns of 21.0% for SAR-1.

Second part of panel A of table 4.3.3 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short position is taken for the stocks those are in highest ACCA portfolio but

not in lowest FD portfolio at the same time. Long position is taken for stocks of first ACCA portfolio stocks which are not in fifth FD portfolio simultaneously. Then combined returns for non-overlapping hedge strategy for ACCA are given which gives significant abnormal returns of 7.3% for SAR-2 at 10 percent level of significance. But one and three year future returns are not significant for non-overlap hedge portfolios of ACCA. Difference between non-overlap and individual hedge returns for ACCA are also given which shows that abnormal returns are significant for first and third year after formation of portfolios. So, one year ahead significant non-overlapping abnormal return are 10.4% and three year ahead non-overlapping return are 7.8% more than basic ACCA hedge.

Similarly to calculate non-overlapping hedge returns of FD anomaly after controlling ACCA we take short for lowest FD stocks which are not in highest ACCA portfolio at the same time and long for highest FD stocks those are not in lowest ACCA portfolio. Non-overlapping hedge returns for FD anomaly after controlling ACCA is significant for SAR-2 and SAR-3 with abnormal returns of 4.1% and 5.6 % respectively. Difference of non-lapping hedge from basic FD hedge returns is significant for second and third year and it may be due to relatively low returns of basic BM hedge. Abnormal return of 4.8% is earned for SAR-2 and 6.6% for SAR-3 at 5 and 10 percent level of significance. This difference in returns shows the difference in perception of investors and way of investing in these markets. Panel B of table 4.3.3 shows the combined results of regression analysis for FD and ACCA. Individual returns for ACCA and FD are given in previous section of this chapter so here only combined regression results are given which shows that no significant abnormal returns for ACCA and FD are earned. But it is seen that FD for SAR-2 and ACCA for SAR-1 gives statistically significant abnormal returns of 12.8% and 11.5% respectively as compare to other

variables. Statistical significance or relative t-value are consider here due to difference in hedge strategy and regression analysis as in first one extreme portfolios are taken to calculate abnormal returns but in later one whole series is considered.

**Table 4.3.3: Results of ACCA and FD combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCA and FD by Hedging</b>				
<b>Return for combined hedge on ACCA and FD</b>		<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>
Short-sell firms simultaneously in 5th ACCA & 1st FD quintile		-0.097	0.045	-0.003
Buy firms simultaneously in 1st ACCA & 5th FD quintile		-0.021	0.024	-0.031
Combined Return of ACCA and FD		-0.119 (1.569)	0.070* (-3.426)	-0.034 (1.235)
Difference b/w combined hedge and basic ACCA hedge return		-0.064 (-0.691)	0.088 (-1.416)	0.017** (-7.045)
Difference b/w combined hedge and basic FD hedge return		-0.210* (1.866)	0.077 (-1.184)	-0.024 (0.106)
<b>Return for Non-overlap hedge for ACCA and FD</b>				
Short-sell firms in 5th ACCA but not simultaneously in 1st FD		0.067	0.048	0.045
Buy firms in 1st ACCA but not simultaneously in 5th FD quintile		-0.017	0.024	-0.019
Non-overlap hedge return for ACCA		0.050 (-0.591)	0.073* (-2.997)	0.026 (-0.411)
Difference b/w non-overlap and basic hedge return for ACCA		0.104* (-2.041)	0.091 (-1.403)	0.078* (-2.323)
Short firms in 1st FD but not simultaneously in 5th ACCA		-0.051	0.022	0.027
Buy firms in 5th FD but not simultaneously in 1st ACCA quintile		0.052	0.019	0.028
Non-overlap hedge return for FD		0.001 (-0.001)	0.041** (-12.99)	0.056* (-2.216)
Difference b/w non-overlap and basic hedge return for FD		-0.091* (4.234)	0.048* (-2.589)	0.066* (-2.758)
<b>Panel B: Tests on relations between ACCA and FD by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCA</b>	<b>FD</b>	<b>MC</b>
<b>SAR-1</b>	-0.074 (1.238)	0.132 (0.991)	0.115 (1.278)	-0.008 (1.241)
<b>SAR-2</b>	0.024 (0.866)	0.128 (1.266)	-0.047 (0.990)	0.005 (0.749)
<b>SAR-3</b>	0.017 (1.066)	0.150 (1.133)	-0.042 (1.211)	0.0009 (0.588)

#### **4.3.4 Combined and Non-overlap Return Results of ACCP and BM:**

Value-glamour and accrual anomalies are tested to see that whether combined returns and returns for single anomaly, by controlling other, are significant or not. Now ACCP is taken as the proxy for accrual anomaly instead of ACCA and BM for value-glamour anomaly. Hedging strategies used for this purpose are according to mispricing theory and same as for individual anomalies but the difference here is that we treat two anomalies at the same time. With hedging strategies results for regression analysis are also given for ACCP and BM.

Table 4.3.4 contains combined and non-overlapping hedging as well as regression results for ACCP and BM. In reference to individual hedge strategies, portfolios of long and short position for ACCP and BM are adopted. As short position was taken for highest accrual and lowest value-glamour portfolios, on the basis of perception of investors, here short position is taken for both of these anomalies at a same time. So, short for fifth ACCP and first BM portfolio is taken. Similarly, long position is taken for lowest ACCP and highest BM portfolio. Firstly results for combined hedge do not give any significant future abnormal returns. The difference of returns between combined hedge and ACCP shows significant positive future returns of 4.7% for SAR-2 and 9.9% for SAR-3. Similarly difference of returns between combined hedge and BM shows significant negative future returns of 7.7% and 1.3% for SAR-1 and SAR-2 respectively.

Second part of panel A of table 4.3.4 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short and long position is taken for ACCP similar to ACCA. Then combined returns for non-overlapping hedge strategy for ACCP are given which does not give significant abnormal returns for all of three years.

**Table 4.3.4: Results of ACCP and BM combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCP and BM</b>				
<b>Return for combined hedge on ACCP and BM</b>		<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>
Short firms simultaneously in 5th ACCP & 1st BM		-0.053	-0.005	0.097
Buy firms simultaneously in 1st ACCP & 5th BM		0.079	0.026	-0.070
Combined Return of ACCP and BM		0.026 (-0.197)	0.020 (-0.646)	0.027 (-0.163)
Diff. b/w combined and basic ACCP hedge return		0.038 (-1.641)	0.047* (-2.125)	0.099* (-2.448)
Difference b/w combined and basic BM hedge return		-0.077* (3.670)	-0.013** (6.168)	0.017 (0.198)
<b>Return for Non-overlap hedge for ACCP and BM</b>				
Sell firms in 5th ACCP but not simultaneously in 1st BM		0.035	0.045	0.064
Buy firms in 1st ACCP but not simultaneously in 5th BM		-0.011	0.001	0.002
Non-overlap hedge return for ACCP		0.023 (-0.512)	0.046 (-1.060)	0.066 (-1.082)
Diff. b/w non-overlap and basic hedge return for ACCP		0.036 (-1.679)	0.073 (-1.727)	0.138* (-2.038)
Sell firms in 1st BM but not simultaneously in 5th ACCP		-0.034	0.003	-0.004
Buy firms in 5th BM but not simultaneously in 1st ACCP		0.066	0.038	0.034
Non-overlap hedge return for BM		0.032 (-0.320)	0.042 (-1.212)	0.030 (-0.769)
Diff. b/w non-overlap and basic hedge return for BM		-0.071* (2.901)	0.008 (1.104)	0.019 (0.026)
<b>Panel B: Tests on relations between ACCP and BM by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCP</b>	<b>BM</b>	<b>MC</b>
<b>SAR-1</b>	-0.009 (0.716)	0.0001 (1.394)	0.061 (1.239)	0.001* (1.683)
<b>SAR-2</b>	-0.0002 (0.376)	-0.0001 (1.416)	0.004 (0.946)	0.029 (0.996)
<b>SAR-3</b>	0.0009 (0.273)	-0.021* (1.543)	-0.004 (0.942)	0.0024 (0.573)

Difference between non-overlap and individual hedge returns for ACCP are also given which shows that significant positive future abnormal returns of 13.8% for third year after formation of portfolios. Similarly to calculate non-overlapping hedge returns of BM anomaly after controlling ACCP we take short and long position as described

earlier for value-glamour anomaly. Non-overlapping hedge returns for BM anomaly after controlling ACCA are not significant for all of the three years but difference of non-lapping hedge from basic BM hedge returns is significant for first year with negative abnormal return of 7.1% and it may be due to relatively low returns of basic BM hedge.

Panel B of table 4.3.4 shows the combined results of regression analysis for BM and ACCP. Individual returns for ACCP and BM are given in previous section of this chapter so here only combined regression results are given which shows that no significant abnormal returns for ACCA and BM are earned. But it is seen that BM for SAR-1 and ACCA for SAR-3 gives statistically significant abnormal returns relative to other variables.

#### **4.3.5 Combined and Non-overlap Return Results of ACCP and CFOP:**

Here ACCP and CFOP are used as proxies for accrual and value-glamour anomalies respectively. Same strategies for short and long positions are used for accrual and value-glamour anomalies as discussed already so, here only abnormal returns are described. Table 4.3.5 contains combined and non-overlapping hedging as well as regression results for ACCP and CFOP. Firstly results for combined hedge do not give any significant future abnormal returns. The difference of returns between combined hedge and ACCP shows significant positive future returns of 0.4% for SAR-1. Similarly difference of returns between combined hedge and BM shows significant negative future returns of 20.8% for SAR-1.

Second part of panel A of table 4.3.5 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short and long position is taken for ACCP similar to ACCA. Then combined

returns for non-overlapping hedge strategy for ACCP are given which does not give significant abnormal returns for all of three years. Difference between non-overlap and individual hedge returns for ACCP are also given which gives significant positive future abnormal returns of 2.2% and 11.7% for SAR-2 and SAR-3 respectively. Similarly combined non-overlapping hedge returns for CFOP anomaly after controlling ACCP are not significant for all of the three years but difference of non-lapping hedge from basic CFOP hedge returns is significant for all three years with abnormal return of -17.2%, -4.5% and 0.7% respectively. So, CFOP don't give significant positive abnormal returns for first and second year size-adjusted returns after formation of portfolio. This shows that both of these two anomalies are based on separate manifestation of same underlying phenomenon.

Panel B of table 4.3.5 shows the combined results of regression analysis for CFOP and ACCP. Individual returns for ACCP and CFOP are given in previous section of this chapter so here only combined regression results are given which shows that significant abnormal returns for ACCA are earned in first and third year and for CFOP only in first year. These significant returns of both anomalies also show both anomalies differ substantially and these results are consistent with Desai et al. (2004) who also find significant future abnormal returns for them.

**Table 4.3.5: Results of ACCP and CFOP combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCP and CFOP</b>				
<b>Return for combined hedge on ACCP and CFOP</b>		<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>
Short-sell firms simultaneously in 5th ACCP & 1st CFOP		-0.071	0.023	0.038
Buy firms simultaneously in 1st ACCP & 5th CFOP quintile		0.063	0.101	0.001
Combined Return of ACCP and CFOP		-0.007 (0.057)	0.124 (-1.592)	0.039 (-1.062)
Difference b/w combined and basic ACCP hedge return		0.004* (-6.449)	0.151 (-1.353)	0.111 (-2.290)
Difference b/w combined and basic CFOP hedge return		-0.208* (2.925)	0.090 (-0.250)	0.053 (-1.520)
<b>Return for Non-overlap hedge for ACCP and CFOP</b>				
Sell firms in 5th ACCP but not simultaneously in 1st CFOP		0.053	0.032	0.062
Buy firms in 1st ACCP but not simultaneously in 5th CFOP		-0.027	-0.037	-0.016
Non-overlap hedge returns for ACCP		0.026 (-0.327)	-0.004 (0.059)	0.045 (-0.576)
Difference b/w non-overlap and basic hedge return for ACCP		0.038 (-1.636)	0.022* (-3.365)	0.117* (-2.222)
Short firms in 1st CFOP but not simultaneously in 5th ACCP		-0.105	-0.018	-0.009
Buy firms in 5th CFOP but not simultaneously in 1st ACCP		0.133	0.007	0.002
Non-overlap hedge return for CFOP		0.027 (-0.115)	-0.011 (0.455)	-0.006 (0.529)
Difference b/w non-overlap and basic hedge return for CFOP		-0.172* (3.558)	-0.045** (7.190)	0.007* (2.443)
<b>Panel B: Tests on relations between ACCP and CFOP by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCP</b>	<b>CFOP</b>	<b>MC</b>
<b>SAR-1</b>	-0.002 (0.318)	0.0002* (1.669)	0.0003* (1.546)	-0.0012 (1.322)
<b>SAR-2</b>	0.0001 (0.256)	-0.0001 (1.251)	0.038 (1.404)	-0.001 (1.091)
<b>SAR-3</b>	-0.001 (0.158)	0.005* (1.824)	0.0013 (1.405)	0.002 (1.101)



#### **4.3.6 Combined and Non-overlap Return Results of ACCP and FD:**

ACCP and FD are used as proxies for accrual and financial distress anomalies respectively. Same strategies for short and long positions are used for accrual and distress anomalies as discussed already so, here only abnormal returns are described. Table 4.3.6 contains combined and non-overlapping hedging as well as regression results for ACCP and FD. Firstly results for combined hedge do not show any significant future abnormal returns. The difference of returns between combined hedge and ACCP also don't show any significant positive future returns. Similarly difference of returns between combined hedge and FD don't show significant positive future returns but negative returns 11.2% for SAR-1.

Second part of panel A of table 4.3.6 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Short and long position is taken for ACCP similar to ACCA. Then combined returns for non-overlapping hedge strategy for ACCP are given which does not give significant abnormal returns for all of three years and it shows that ACCP don't differ substantially from distress anomaly. Difference between non-overlap and individual hedge returns for ACCP are also given which gives significant positive future abnormal returns of 5.1% and 10.5% for SAR-2 and SAR-3 respectively. Similarly combined non-overlapping hedge returns for FD anomaly after controlling ACCP are significant for SAR-2 as it gives abnormal future return of 3.8%. Difference of non-lapping hedge from basic FD hedge returns is significant for all three years with abnormal return of -10.8%, 4.5% and 0.6% respectively.

**Table 4.3.6: Results of ACCP and FD combined and non-overlap return.**

<b>Panel A: Tests on relations between ACCP and FD</b>				
<b>Return for combined hedge on ACCP and FD</b>	<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>	
Short firms simultaneously in 5th ACCP & 1st FD	-0.054	0.073	0.138	
Buy firms simultaneously in 1st ACCP & 5th FD	0.033	0.008	-0.025	
Combined Return of ACCP and FD	-0.021 (0.241)	0.081 (-1.258)	0.113 (-0.693)	
Diff. b/w combined hedge and basic ACCP hedge return	-0.009 (-1.725)	0.108 (-1.493)	0.185 (-1.775)	
Diff. b/w combined hedge and basic FD hedge return	-0.112* (2.620)	0.088 (-1.161)	0.124 (-1.173)	
<b>Return for Non-overlap hedge for ACCP and FD</b>				
Sell firms in 5th ACCP but not simultaneously in 1st FD	0.046	0.026	0.042	
Buy firms in 1st ACCP but not simultaneously in 5th FD	-0.010	-0.002	-0.009	
Non-overlap hedge return for ACCP	0.035 (-0.627)	0.024 (-0.862)	0.033 (-0.643)	
Diff. b/w non-overlap and basic hedge return for ACCP	0.048 (-1.512)	0.051* (-2.041)	0.105* (-2.364)	
Sell firms in 1st FD but not simultaneously in 5th ACCP	-0.057	0.013	-0.022	
Buy firms in 5th FD but not in 1st ACCP simultaneously	0.040	0.025	0.018	
Non-overlap hedge return for FD	-0.016 (0.172)	0.038* (-3.343)	-0.004 (0.106)	
Difference b/w non-overlap and basic hedge return for FD	-0.108* (5.527)	0.045* (-2.698)	0.006* (2.619)	
<b>Panel B: Tests on relations between ACCP and FD by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>ACCP</b>	<b>FD</b>	<b>MC</b>
<b>SAR-1</b>	-0.071 (1.253)	0.0001 (1.389)	0.212 (1.341)	-0.0005 (1.283)
<b>SAR-2</b>	0.024 (0.941)	-0.0001 (1.228)	-0.039 (0.981)	0.0002 (0.834)
<b>SAR-3</b>	0.021 (1.083)	-0.027 (1.400)	-0.035 (1.217)	0.0002 (0.0423)

So, distress anomaly does not give significant positive abnormal returns for first year size-adjusted returns after formation of portfolio. This shows that both of these two anomalies are based on separate manifestation of same underlying phenomenon. Panel B of table 4.3.6 shows the combined results of regression analysis for FD and ACCP.

Individual returns for ACCP and FD are given in previous section of this chapter so here only combined regression results are given which shows that statistically significant abnormal returns for ACCP are earned in first and third year and for FD only in first year. These significant returns of both anomalies also show both anomalies differ substantially and these results are consistent with Desai et al. (2004) who also find significant future abnormal returns for them.

#### **4.3.7 Combined and Non-overlap Return Results of BM and FD:**

BM and FD are used as proxies for value-glamour and financial distress anomalies respectively. Same strategies for short and long positions are used for value-glamour and distress anomalies as discussed already so, here only abnormal returns are described. Table 4.3.7 contains combined and non-overlapping hedging as well as regression results for BM and FD. Firstly results for combined hedge do not show any significant future abnormal returns. The difference of returns between combined hedge and BM gives significant negative future returns of 7.6% for SAR-1. Similarly difference of returns between combined hedge and FD also gives significant negative future returns of 6.3% for SAR-1. Second part of panel A of table 4.3.7 shows results for non-overlapping hedge returns and as discussed earlier these are returns of one portfolio by controlling other portfolio. Then combined returns for non-overlapping hedge strategy for BM are given which give significant abnormal returns of 5.4% and 2.5% for second and third year and it shows that BM differ substantially from distress anomaly. Difference between non-overlap and individual hedge returns for BM are also given which gives significant future abnormal returns of -4.1% and 1.8% for SAR-1 and SAR-2 respectively. Similarly combined non-overlapping hedge returns for FD anomaly after controlling BM are not significant for all of three years. Difference of non-lapping

hedge from basic FD hedge returns is significant for all three years with abnormal return of -8.9% and 5.5% for first and third year respectively.

**Table 4.3.7: Results of BM and FD combined and non-overlap return.**

<b>Panel A: Tests on relations between BM and FD</b>				
<b>Return for combined hedge on BM and FD</b>	<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>	
Short-sell firms simultaneously in 1th BM & 1th FD quintile	-0.086	-0.026	0.009	
Buy firms simultaneously in 5th BM & 5th FD quintile	0.113	0.159	0.133	
Combined Return of BM and FD	0.027 (-0.137)	0.132 (-0.712)	0.142 (-1.146)	
Diff. b/w combined hedge and basic BM hedge return	-0.076* (3.718)	0.099 (-0.316)	0.132 (-0.845)	
Diff. b/w combined hedge and basic FD hedge return	-0.063* (3.860)	0.140 (-1.102)	0.153 (-1.140)	
<b>Return for Non-overlap hedge for BM and FD</b>				
Sell firms in 1th BM but not simultaneously in 1th FD	0.0001	0.020	0.011	
Buy firms in 5th BM but not in 5th FD simultaneously	0.062	0.031	0.013	
Non-overlap hedge return for BM	0.062 (-1.016)	0.052* (-4.889)	0.025*** (-16.72)	
Diff. b/w non-overlap and basic hedge return for BM	-0.041** (6.058)	0.018* (2.650)	0.015 (0.352)	
Short firms in 1th FD but not simultaneously in 1th BM	-0.029	0.072	0.039	
Buy firms in 5th FD but not simultaneously in 5th BM quintile	0.032	0.015	0.005	
Non-overlap hedge return for FD	0.002 (-0.035)	0.088 (-1.548)	0.045 (-1.307)	
Difference b/w non-overlap and basic hedge return for FD	-0.089* (4.117)	0.095 (-1.913)	0.055* (-3.192)	
<b>Panel B: Tests on relations between BM and FD by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>BM</b>	<b>FD</b>	<b>MC</b>
<b>SAR-1</b>	-0.069 (1.192)	0.045 (1.245)	0.108 (1.199)	-0.0005 (1.420)
<b>SAR-2</b>	0.031 (0.906)	0.005 (0.794)	-0.054 (0.896)	0.0002 (0.726)
<b>SAR-3</b>	0.023 (1.140)	-0.007 (0.872)	-0.038 (1.212)	0.0025 (0.632)

So, FD gives significant positive abnormal returns for third year size-adjusted returns after formation of portfolio. This shows that both of these two anomalies are based on separate manifestation of same underlying phenomenon. Panel B of table 4.3.7 shows the combined results of regression analysis for FD and BM. Individual returns for BM and FD are given in previous section of this chapter so here only combined regression results are given which shows that statistically significant abnormal returns for BM are earned in first year. These significant returns of both anomalies also show both anomalies differ substantially for size-adjusted returns of first year.

#### **4.3.8. Combined and Non-overlap Return Results of CFOP and FD.**

CFOP and FD are used as proxies for value-glamour and financial distress anomalies respectively. Same strategies for short and long positions are used for value-glamour and distress anomalies as discussed already so, here only abnormal returns are described. Table 4.3.8 contains combined and non-overlapping hedging as well as regression results for CFOP and FD. Firstly results for combined hedge gives significant future abnormal returns of 3.7% and 2.0% for second and third year of formation of portfolio. The difference of returns between combined hedge and CFOP gives significant future returns of -200.3% for SAR-1 and 0.3% for SAR-2. Similarly difference of returns between combined hedge and FD also gives significant negative future returns of 9.4% for SAR-1.

Second part of panel A of table 4.3.8 shows results for non-overlapping hedge return and as discussed earlier these are returns of one portfolio by controlling other portfolio. Then combined returns for non-overlapping hedge strategy for CFOP are given which don't show any significant abnormal returns for all of three years and it shows that CFOP do not differ substantially from distress anomaly.

**Table 4.3.8: Results of CFOP and FD combined and non-overlap return.**

<b>Panel A: Tests on relations between CFOP and FD</b>				
<b>Return for combined hedge on CFOP and FD</b>	<b>SAR-1</b>	<b>SAR-2</b>	<b>SAR-3</b>	
Sell firms simultaneously in 1th CFOP & 1th FD	-0.072	0.025	0.007	
Buy firms simultaneously in 5th CFOP & 5th FD	0.069	0.012	0.012	
Combined Return of CFOP and FD	-0.002 (0.020)	0.037* (-2.727)	0.020* (-3.841)	
Diff. b/w combined and basic CFOP hedge return	-0.203* (2.972)	0.003*** (16.321)	0.034 (-1.813)	
Diff. b/w combined hedge and basic FD hedge return	-0.094* (2.939)	0.045 (-1.317)	0.031 (-1.694)	
<b>Return for Non-overlap hedge for CFOP and FD</b>				
Sell firms in 1th CFOP but not simultaneously in 1th FD	-0.105	-0.040	0.056	
Buy firms in 5th CFOP but not simultaneously in 5th FD	0.141	0.047	-0.013	
Non-overlap hedge return for CFOP	0.035 (-0.145)	0.006 (-0.072)	0.043 (-0.622)	
Diff. b/w non-overlap and basic hedge return for CFOP	-0.164* (3.435)	-0.027* (3.462)	0.057 (-1.484)	
Sell firms in 1th FD but not simultaneously in 1th CFOP	-0.020	0.021	0.065	
Buy firms in 5th FD but not simultaneously in 5th CFOP	0.014	0.032	0.007	
Non-overlap hedge return for FD	-0.005 (0.171)	0.053** (-4.850)	0.073 (-1.276)	
Diff. b/w non-overlap and basic hedge return for FD	-0.097** (4.637)	0.060* (-2.296)	0.083* (-2.391)	
<b>Panel B: Tests on relations between CFOP and FD by Regression Analysis</b>				
<b>Dependent Variable</b>	<b>Independent Variables</b>			
	<b>Intercept</b>	<b>CFOP</b>	<b>FD</b>	<b>MC</b>
<b>SAR-1</b>	-0.065 (1.175)	0.009 (1.312)	0.115 (1.259)	-0.0012 (1.283)
<b>SAR-2</b>	0.027 (0.938)	0.0026 (1.403)	-0.044 (0.964)	0.014 (0.875)
<b>SAR-3</b>	0.024 (1.117)	0.0019 (1.161)	-0.042 (1.225)	0.0019 (0.690)

Difference between non-overlap and individual hedge returns for CFOP gives

significant future abnormal returns of -16.4% and -2.7% for SAR-1 and SAR-2

respectively. Similarly combined non-overlapping hedge returns for FD anomaly after controlling CFOP are significant for second year after formation of portfolio which is 5.3%. Difference of non-lapping hedge from basic FD hedge returns is significant for all three years with abnormal return of -9.7%, 6.0% and 5.5% for first second and third year respectively. So, FD gives significant positive abnormal returns for second and third year size-adjusted returns after formation of portfolio. This shows that both of these two anomalies are based on separate manifestation of same underlying phenomenon.

Panel B of table 4.3.8 shows the combined results of regression analysis for FD and CFOP. Individual returns for CFOP and FD are given in previous section of this chapter so here only combined regression results are given which shows that statistically significant abnormal returns for CFOP are earned in first and second year and for FD in first and third year. These significant returns of both anomalies also show both anomalies differ substantially for size-adjusted returns of first year.

#### **4.4. Difference in Abnormal Returns among Hedging and Regression**

##### **Analysis:**

It is seen throughout the analysis of results that there exists significant difference among future abnormal returns of various strategies in hedging and regression analysis. This differential in abnormal returns in both techniques may be due to several reasons. This differential may occurred difference in analyzed data as in hedging extreme portfolios are taken and then short or long position is taken according to different strategies but in regression analysis whole series of size-adjusted returns are taken. Due to this difference in distribution of data regression results are less significant as compare to hedge returns.

Second major reason of this return differential may be due to relation of anomalies with size-adjusted returns of various years. In this study only linear relationship is supposed to exist among size-adjusted returns and anomalies but this relationship may be non-linear which cause less significance of abnormal returns in regression analysis.

#### **4.5 Future Abnormal Returns of One Anomaly by Controlling Two Anomalies:**

This section contains the results of regression analysis to see whether one anomaly is gives significant abnormal returns after controlling other two anomalies at a time. This section does not include hedging results as hedge portfolios contain 20% of the total firms which mean 60 out of 300 firms are present in each quintile. But when we go for hedge returns of the firms those are included in all of three anomalies than very little number of firms left. Due to this little number of firms the results of one anomaly after controlling other two anomalies may be biased. So, regression results of all combinations for various proxies of value-glamour, accrual and distress anomalies are given taking size-adjusted returns of 1, 2 and 3 year as dependent variable.

**Table 5.5.1: Returns for SAR-1 for More Than 2 Anomalies at a Time.**

<b>SAR-1</b>	<b>Intercept</b>	<b>MC</b>	<b>ACCA</b>	<b>ACCP</b>	<b>BM</b>	<b>CFOP</b>	<b>FD</b>
<b><math>\beta</math></b>	-0.076	0.006*	0.141		0.049		0.103
<b>t-stat</b>	(1.228)	(1.493)	(1.024)		(1.241)		(1.172)
<b><math>\beta</math></b>	-0.072	0.004	0.141			0.0001	0.110
<b>t-stat</b>	(1.209)	(1.423)	(1.052)			(1.343)	(1.244)
<b><math>\beta</math></b>	-0.018	0.009*	0.154		0.061	0.0002	
<b>t-stat</b>	(0.807)	(1.484)	(1.118)		(1.224)	(1.401)	
<b><math>\beta</math></b>	-0.073	0.001	0.148		0.048	0.000	0.099
<b>t-stat</b>	(1.199)	(1.488)	(1.074)		(1.236)	(1.291)	(1.138)
<b><math>\beta</math></b>	-0.073	0.0001*		0.0002	0.047		0.111
<b>t-stat</b>	(1.244)	(1.500)		(1.514)	(1.253)		(1.204)
<b><math>\beta</math></b>	-0.068	0.006		0.001*		0.0001*	0.110
<b>t-stat</b>	(1.246)	(1.285)		(1.702)		(1.642)	(1.329)
<b><math>\beta</math></b>	-0.012	0.0005		0.0003*	0.058	0.0005*	
<b>t-stat</b>	(0.695)	(1.381)		(1.527)	(1.251)	(1.644)	



$\beta$	-0.069	0.007		0.001*	0.045	0.001*	0.100
t-stat	(1.235)	(1.359)		(1.645)	(1.260)	(1.596)	(1.192)
$\beta$	-0.008	0.006			0.059	0.006	
t-stat	(0.722)	(1.365)			(1.230)	(1.343)	
$\beta$	-0.067	0.0001			0.045	0.0004	0.105
t-stat	(1.166)	(1.359)			(1.240)	(1.260)	(1.166)

Only significant abnormal returns are discussed to see shortly whether any anomaly is present in presence of other anomalies. For size-adjusted returns of first year ACCP and CFOP give significant abnormal returns of 0.1% and 0.01% but FD and BM does not give any significant returns. It means that in some cases CFOP and ACCP are not same anomalies and have some factors different from each other.

Similarly for SAR-2 in most of the cases CFOP gives significant abnormal returns while other anomalies don't which means that CFOP anomaly is not same as that of accrual and distress anomalies. And results for SAR-3 as dependent variable shows that in most of the cases ACCP and CFOP gives significant abnormal returns which means that these accrual and value-glamour anomalies are distinct phenomenon from one another. Distress anomaly share common features with other two anomalies but don't contain not substantially distinct features.

**Table 5.5.2: Returns for SAR-2 for More Than 2 Anomalies at a Time.**

SAR-2	Intercept	MC	ACCA	ACCP	BM	CFOP	FD
B	0.029	0.0001	0.137		0.010		-0.061
t-stat	(0.876)	(0.730)	(1.278)		(0.820)		(0.927)
B	0.025	0.003	0.136			0.003	-0.050
t-stat	(0.856)	(0.936)	(1.255)			(1.211)	(0.984)
B	-0.007	0.002	0.144		0.007	0.0002	
t-stat	(0.413)	(0.800)	(1.284)		(0.906)	(1.257)	
B	0.029	0.0006	0.144		0.009	0.000	-0.062
t-stat	(0.852)	(0.887)	(1.270)		(0.812)	(1.243)	(0.911)
B	0.030	0.0004		0.0001	0.005		-0.051
t-stat	(0.911)	(0.830)		(1.269)	(0.794)		(0.902)
B	0.026	0.003		0.0001		0.0007*	-0.043
t-stat	(0.949)	(1.054)		(1.276)		(1.512)	(1.005)
B	-0.001	0.007		0.0005	0.004	0.0004*	
t-stat	(0.300)	(1.104)		(1.273)	(0.923)	(1.499)	

<b>B</b>	0.030	0.0002		0.0002	0.005	0.0001*	-0.054
<b>t-stat</b>	(0.923)	(1.039)		(1.297)	(0.766)	(1.532)	(0.924)
<b>B</b>	0.000	0.0004			0.005	0.0002*	
<b>t-stat</b>	(0.396)	(0.816)			(0.929)	(1.549)	
<b>B</b>	0.032	0.0001			0.006	0.0005	-0.055
<b>t-stat</b>	(0.916)	(0.833)			(0.782)	(1.446)	(0.881)

**Table 5.5.3: Returns for SAR-3 for More Than 2 Anomalies at a Time.**

SAR-3	Intercept	MC	ACCA	ACCP	BM	CFOP	FD
<b>B</b>	0.018	0.0001	0.159		-0.003		-0.047
<b>t-stat</b>	(1.103)	(0.675)	(1.148)		(0.897)		(1.220)
<b>B</b>	0.019	0.0001	0.157			0.0001	-0.049
<b>t-stat</b>	(1.079)	(0.658)	(1.095)			(1.176)	(1.205)
<b>B</b>	-0.009	0.0006	0.167		-0.004	0.0002	
<b>t-stat</b>	(0.468)	(0.584)	(1.169)		(0.909)	(1.079)	
<b>B</b>	0.020	0.0005	0.165		-0.003	0.0001	-0.052
<b>t-stat</b>	(1.112)	(0.650)	(1.108)		(0.874)	(1.110)	(1.236)
<b>B</b>	0.022	0.003		0.0001	-0.015		-0.038
<b>t-stat</b>	(1.101)	(0.600)		(1.367)	(0.726)		(1.235)
<b>B</b>	0.021	0.0004		0.002*		0.0001*	-0.040
<b>t-stat</b>	(1.065)	(1.061)		(1.923)		(1.539)	(1.219)
<b>β</b>	-0.001	0.0001		0.0002*	-0.004	0.005	
<b>t-stat</b>	(0.226)	(1.050)		(1.817)	(0.901)	(1.381)	
<b>β</b>	0.022	0.0002		0.0001*	-0.006	0.003*	-0.042
<b>t-stat</b>	(1.098)	(1.034)		(1.933)	(0.854)	(1.522)	(1.248)
<b>β</b>	0.000	0.002			-0.006	0.0001	
<b>t-stat</b>	(0.251)	(0.667)			(0.906)	(1.096)	
<b>β</b>	0.025	0.0006			-0.007	0.006	-0.044
<b>t-stat</b>	(1.151)	(0.653)			(0.852)	(1.104)	(1.262)

## **Conclusion**

Many studies are done in search of abnormal returns in many financial markets. This study tell how different anomalies gives abnormal returns and more importantly how these anomalies differ from each other in term of future abnormal returns. If two anomalies gave significant positive future abnormal returns it means that both of these anomalies are not alike and investors can step in both of them at a same time to get arbitrage. Value-glamour, accrual and financial distress anomalies are studied it is tested by hedge portfolios and regression analysis that whether these anomalies are present in KSE and are these anomalies have similar underlying phenomenon or not.

Talking about the individual anomaly in KSE, value-glamour and distress anomalies are present but accrual anomaly does not exist. Jawad and Javaid (2015) find accrual anomaly in case for Pakistan but result may differ due difference in calculation technique of accruals. Results of regression analysis less significant as compare to hedging and this may cause due to several reasons as discussed like non-linearity of relationship, difference of distribution of data etc.

It is also seen that accrual anomaly by using ACCA substantially differ from distress (FD) anomalies which means investor could earn positive future abnormal returns by going in accrual and distress anomaly at a time. Similarly, value-glamour (CFOP & BM) and distress anomaly also have distinct underlying phenomenon. But accrual (ACCA) and value-glamour (BM) share common feature which shows that both of these anomalies don't gave abnormal future returns individually. Same is the case between distress (FD) and value-glamour (CFOP) anomalies.

## **Limitations**

1. Regression analysis does not give significant future abnormal returns which may be due to non-linear relationship among size-adjusted returns and different anomalies and should also be tested.
2. Only few proxies for various anomalies are used so other variables like sales growth, earning to price ratio, debt to equity ratio may also be tested.
3. Annual market prices are used to calculate returns but average of monthly prices could be better for this purpose and results may differ by incorporating it.
4. Size-adjusted returns do not fully adjust factor and it should also be incorporated.

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