EARNINGS PER SHARE VERSUS CASH FLOW PER SHARE AS PREDICTOR OF DIVIDEND: EVIDENCE FROM NON FINANCIAL FIRMS OF PAKISTAN

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Earnings per share versus cash flow per share as predictor of dividend: Evidence from non financial firms of Pakistan.

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ABSTRACT

Dividend policy is one of the most researched topics in corporate finance; therefore it is called by some academics an unsolved puzzle. This study investigated to compare the relative predictive power of both earnings and cash flow in order to find out that which one is the best predictor of dividend in context of Pakistan non financial sector. The study has used panel data techniques and the data has been collected from the balance sheet analysis of KSE 100 index non financial companies. A sample of 104 companies from textile sector, energy sector, pharmaceutical sector and cement sector has been used. This study followed a quantitative research method with a deductive approach. This study is based on the dividend residual theory, dividend signaling theory and agency theory. The study employed a linear mixed effect model approach to investigate our main problem. Beside this other techniques like OLS regression analysis and correlation analysis has also been applied to check the relationship of independent variables with dependent variable. The results of the linear mixed effect model have shown that cash flow is a better predictor of dividend then earning. The study also concluded that both earnings and cash flows have a significant positive relationship with dividend. The study supported the agency theory of free cash flow, dividend residual theory and signaling hypothesis. The study also finds out that firms size (SIZE), leverage ratio (LR), market to book value (MBV) and liquidity ratio (LIQ) have a significant relationship with dividend.

Key words: Earning per share (EPS), Cash flow per share (CFPS), Dividend, Linear mixed effect model, Log likelihood estimator, Akaiki information Criteria (AIC) and KSE-100 index

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DECLARATION

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CHAPTER 1

INTRODUCTION

1.1. Background of the study

Dividend is considered to be the most debatable topic in corporate finance literature and according to Black, (1976) *"The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together"*. Both cash flow and earnings are considered to be important predictors of dividend. Consler et al (2011) said that cash flow is important for generating earnings and similarly earnings is important for paying cash dividend. Similarly (Dechow, et al 1997) discussed the relationship between earnings and cash flows and found that the forecast of future cash flows can be done by current earnings which mean that earnings and cash flows have a close link with one another. However, according to (Healy, 1985), manager can easily manipulate earnings for their self interest. Secondly, cash flows have a direct link with liquidity and liquidity is considered to be an important factor in setting dividend policy. So, he clearly describes that cash flow is superior to earnings.

The association between both earnings and cash flow with dividend has been established in the previous studies. Lintner (1956) presented the first study in which he suggests that changes in dividend depend on the current earnings and preceding year dividend. After that, some of the studies have also attempted to investigate the relationship between cash flow and dividend changes Bowen et al (1986), Stephanus, (2008) and Al-Najjar and Belghitar, (2012). Similarly, Healy (1985) argued that cash flow is more reliable than earnings in determining firm value. Lee (1983) also

identified that a company paid their dividend on basis of cash flow, not on earnings because the financial position can be better described by their cash flow.

1.2. Theoretical frame work

The purpose of the current study is to make comparison of cash flow and earnings in term of their relative predictive ability and to find out which one is a better predictor of dividend in context of non financial sector of Pakistan. The current study is based on the agency theory of free cash flow which was presented by Jenson (1986), dividend residual theory of Lintner (1956) and dividend signalling theory (Bhattacharya, 1979).

1.2.1. Agency theory of free cash flow: According to Jensen (1986) sometime the agency conflict arises between share holders and manager, which leads to a high agency cost in the form of supervision by the share holders. The conflict of interest arises when the manager uses the cash of business for their personnel benefits or makes investments that have negative present value. Therefore, in order to reduce the agency conflict, the manager uses free cash flow to pay dividend to the share holders.

So, this theory clearly explains the link between cash flow and dividend, which means that cash flow, is the major sources of the dividend payment. After that, many empirical studies supported the study of (Jensen, 1986). Adelegan, (2003) found that cash flow is a significant determinant of dividend of small sized firms. He also found that the relationship between cash flow and dividend is significant in averagely geared firms and in high growth firms. Similarly, *Gairatjon* (2012) and Stephanus, (2008) also found a positive and significant association between cash flows and dividend.

1.2.2 Dividend residual theory: The dividend residual theory of (Lintner, 1956) states that dividend is only paid out from the retained earnings when all future investment opportunity has been financed. He further explained that management of a firm increases their dividend when they are sure that earnings have increased permanently. The study of (Lintner, 1956) has been supported by many empirical studies. According to Fama and French (2001), firms decrease their dividend due to negative earnings. Similarly, Koch and Sun (2004) identified that the reaction of market at the time of dividend changes is due to previous changes in earnings. So their study clearly indicates an association between dividend and earnings.

1.2.3. Dividend signalling theory: The origin of the signalling hypothesis starts from Lintner's (1956) studies who found that changing dividend payment has a positive effect on firm's stock price. Another important study regarding signalling theory was conducted by Bhattacharya (1979), which states that dividends may function as a signal of expected future cash flows. An increase in the dividends indicates that the managers expect higher cash flows in the future. Modigliani and Miller (1961) also argued in favour of the dividend relevance theory who stated that in the real world disregarding the perfect capital markets, dividend provides an "information content" which may affect the market price of the stock. Benartzi, et al (1997), found that change in dividend only provides information content about the past earnings, but not about the future earnings. After that, many researchers have supported the signalling theory and today, it is seen as one of the most influential dividend theories. It means that dividend can be used as information content for estimating a firm's earnings and cash flows.

As the agency theory of free cash flow has explained that cash flow is the main source of dividend, while dividend residual theory said that dividend is paid from retained earnings. Similarly, signalling theory also explained that dividend can be used as signal for estimating a firm's earnings and cash flow. So, the above theories provide a sound foundation for this study.

This study has used two models, which are earnings based model and cash flow based model. In earnings based model, earnings per share have been linked with dividend per share along with control variables, while in cash flow based model, cash flow has been linked with dividend per share along with control variables. The control variables include firm size, market to book value ratio, leverage ratio and liquidity ratio. Our main hypothesis of the study is based on the study of (Consler, et al 2011), who found that cash flow is better than earnings in predicting dividend. Most of the past studies were focused on the link between earnings and dividend. But some of the recent studies have also proved a significant association between cash flow and dividend. However the issue still remains that which one is relatively better predictor of dividend than the other.

1.3. Research gap:

The previous literature has described that most of the studies linked earnings and dividend and conclude that earnings is a better predictor of dividend (Lintner, 1956) and (Koch and Sun 2004). However some of the studies also showed that cash flow is a better predictor of dividend (Bowen et al, 1986) and (Fama and French, 2001). There are very few studies that have tested the relative predictive ability of both cash flow and earnings in predicting dividend. Consler et al (2011) concluded that cash flow is considered to be a better predictor of dividend than earnings. But his study is

based on US firms which are operating in a developed capital market. The current study is based on Pakistani economy which is an emerging capital market that has different tax policies and rule regulations from that of the developed economies. Unlike the study of Consler et al (2011) this study has used a modified structure for the model by changing the combination of control variables. Similarly the current study has also used different measures for dividend and liquidity ratio. Although a few studies in Pakistan have found both current earnings and cash flow as predictor of dividend (Ahmad and Javid, 2012) (Mirza and Afza, 2014), but still they did not identified that which one between cash flow and earnings is better in predicting dividend. So, the current study is the first study according to the best of my knowledge which has explored this subject matter.

1.4. Problem statement

From the above discussion, it is clear that both cash flow and earnings have been separately linked with dividend (Jenson, 1986), (Lintner, 1956) and (Fama and French, 2001). It has already been discussed that managers uses cash flows in order to overcome agency conflicts between share holders and manager (Jenson, 1986). While Lintner (1956) and Fama & French (2001) concluded that earnings is important for dividend. However, some studies have found that cash flow is a better predictor of dividend than earnings (Healy 1985)(Adelegan 2003) and (Consler, et al, 2011). The current study is based on the non financial sector firms of Pakistani which are operating in emerging economy and which have different tax rate and dividend payout policies as compared to developed economies (Zameer et al, 2013). In Pakistan cash flow emerges as an important factor affecting the firm's ability to pay dividends (Mirza and Afza, 2014) but the question is that whether cash flow is considered to be

a better predictor of dividend than earnings. Therefore the current study will explored its main problem that is "*whether cash flow per share is better than earning per share in predicting dividend in context of Pakistan non financial sector*".

1.5. Research questions:

The following are the research questions of the study

1) Is cash flow per share better than earning per share in predicting dividend?
2) Does cash flow per share have a significant association with dividend?
3) Does earning per share have a significant association with dividend?

1.6. Research objectives:

1) To assess which of the two variables, earnings per share or cash flow per share, does better in predicting dividends.
2) To find out the relationship between cash flow per share and dividend.
3) To find out the relationship between earning per share and dividend.

1.7. Significance of the study

When investor evaluating the performance of their investment, their main focus is that how much value is created by their investment. Dividend is an important factor in stock valuation process. Therefore investors and analyst should focus on cash flow as predictor of dividend during stock valuation. This study also suggests that a firm with large amount of cash flow have the ability to pay more dividends. This study will help dividend policy makers about the importance of both cash flows and earnings in setting up dividend policy. This study also shed light on the significant role of other factors like firm size, market to book value, Firm liquidity and debt level in building a dividend policy. Furthermore, this study is most important for academic researchers as

a road map for making some additional contribution to the existing literature especially in context of Pakistan.

Contribution of the Study

Practical contribution:

This study will help Pakistani corporate sector in understanding the role of cash flow in creation of dividend. It will help company's stake holders to predict the dividends accurately from the available earnings and cash flows. Hence, the results of this study can be used as useful tools for constructing policies related to dividend payout ratio. A firm that wants to maintain a stable dividend policy should focus on their cash flow generation, therefore the current study will contribute to corporate daily practices like improving cash flows, helping prospective investors to use cash flow as predictor for current and future dividend.

Academic contribution: This study has tested the applicability of agency theory of free cash flow (Jenson, 1986), dividend residual theory (Lintner, 1956) and signalling theory (Bhattacharya 1979) in context of Pakistan corporate sector. The results of this study will contribute to the exiting literature by finding the best predictor of dividend in context of Pakistan corporate sector. As this study is new in Pakistan to the best of my knowledge, so it will give a future research direction to the researcher to do further detailed study especially in Pakistan.

Hence, the results of this study can be used as useful tools for constructing policies related to dividend payout ratio. A firm that wants to maintain a stable dividend policy should focus on their cash flow generation, therefore the current study will contribute to corporate daily practices like improving cash flows, helping prospective investors

to use cash flow as predictor for current and future dividend. This study has tested the applicability of agency theory of free cash flow (Jenson, 1986), dividend residual theory (Lintner, 1956) and signalling theory (Bhattacharya 1979) in context of Pakistan corporate sector.

Economic Contribution: As it has already been discussed by most studies that cash flow is the main contributor to dividend, which means that the dividend policy of a company depends on its cash flow. In the study of (Mortimer and Page, 2012), they described that there is a close relationship between dividend per share ratio and consumer price index (CPI). Considering the above study, it can be concluded that cash flow of a company also contributes to a country economy, because cash flow is a major source for dividend, which directly affects a company economy.

1.7. Organization of the study

The study has been divided into the following sections.

The chapter one of this study includes the introduction of the study, which is further divided into subparts, which are background of the study, theoretical frame work, gap identification, problem statement, research questions, research objectives, significance of the study and contribution of the study. Chapter two of the study comprises literature review. Chapter three includes the methodology of the study, which is further sub divided into study population and sample, type of data, sources of data, measurement tools, operational definitions and proposed model of the study. Chapter four of the study includes data analysis and discussion of results, while chapter five will include conclusion, practical implication, limitation and direction for future research direction.

CHAPTER 2

LITERATURE REVIEW

The term dividend policy implies the management decisions about the size and timing of dividend payment to their share holders. The dividend policy is an important issue in corporate finance, because it is considered being major cash out flow for a firm in the form of cash dividend. Since the middle of the last century many finance scholars worked on dividend policy in order to solve several issues with respect to dividend and they formulated different models and theories to explain dividend behaviour. Dividend policy has been a controversial issue in finance.

The first model of dividend payment was introduced by Lintner (1956), which argued that current earning and preceding dividend level are the main determinants of changes in dividend. He further concluded that current earnings are the only factor that can bring change in yearly dividend payment with a target payout ratio. Since the study of Lintner (1956), many researchers investigated this topic and theories have been presented by the researches related to the issue of dividend policy.

2.1 Dividend theories

There are different theories regarding the dividend policy. The most focused question regarding the dividend policy is that whether company should pay the dividend or retain it for future investments? This question is one of the unsolved problems in the financial theory and has resulted in a great number of studies during the decades. Before going to discuss the empirical studies on dividend, first, we will give a review of some relevant dividend theories related to this study.

2.1.1 Dividend Irrelevance Theory: Miller and Modigliani (1961) presented their dividend irrelevance theory which states that under the perfect market and zero taxes the dividend of a firm does not affect the value of a company. They further explained that the dividend is solely depending on the earning capacity of the firms and the risk associated to the investment. Miller and Modigliani (1961) also states that manager can change dividend only when he expects some future earnings and cash flow, while current earnings have no role in dividend changing. Under the condition of symmetric information in the market the dividend policy has no impact of the value of the share price. The net effect of the increase or decrease of dividend will be zero over time because higher dividend will increase the outflow of capital, which could have been used in future earning projects as a result the share holder's future capital gain decreases.

2.1.2 Dividend Relevance Theory: Another theory of divided policy is relevance theory which opposes the dividend irrelevance theory. Gordon (1963) supported the theory that dividend is relevant to the value of the company. In other words increasing dividend has a positive impact on the company's market value. He presented his view that shareholder prefers current dividend, which is also supported by bird in hand thinking of (Firer, et al, 2004). The more time it takes to pay the dividend to share holder the riskier will be the cash flow. Gordon, (1959) who developed dividend growth model in which he explained that the value of a share is the function of dividend.

2.1.3. Information content theory: Another theory related to dividend policy is the information content theory, which states that any change in dividend contains information about the future earnings and past earnings. That is the reason that in spite

of bearing cost by the firm, they pay dividends because of the positive reaction of the market and creation of greater value due to the payment of dividend. According to Firer (2004) when dividend payout ratio unexpectedly increased, these increases in dividend are linked with the increase in share price. Similarly, in case of unexpected decrease in dividend, the share prices also decrease. He further described that companies are reluctant to cut their dividend because it gives a signal to the market that the company is in financial crises. When manager decided that the current dividend policy cannot be maintained in the future, it gives a negative signal about the expected future dividend so the share price falls. Similarly in case of unexpected increase in the current dividend gives a signal that the manager expects some positive results about the company future performance and increase in divided which automatically brings an upward movement in share price.

2.1.4. Dividend Residual Theory: Another theory about the dividend policy which contradicts the bird in hand theory of Lintner (1956) and Gordon (1959) is the dividend residual theory. This theory states that dividend is only paid out from the retained earnings, after all future investment opportunities have been financed. This theory also states that instead of expecting short term pay out, investors prefer more to future earnings of the company (Mjaco, 2000). So, the company pays a small percentage of their profits as dividend if it has many investment opportunities in future and it will pay a high percentage of profit as dividend if it has small investment opportunities.

2.1.5 Agency Theory: Jensen and Meckling (1976) presented one of the most influential studies in that provide a new concept about the agency problem and agency cost. This theory has been used as a bench mark by different researchers. According

to their definition, the agency cost is the cost that emerges as a result of conflicts of interest between the principle and agent. Where the agent is hired by the principal and gives him certain power to maximize the wealth of the principals. They state that only stock holder and bond holder have the right to claim the company assets, so, they can be considered as principals.

Although the study of Jensen and Mecklin (1976) has provided a clear definition of agency cost, but still they were unable to confirm the effect of agency cost on dividend policy. However some time in case of large free cash flow a firm may face overinvestment problem which is one implication of the free cash flow hypothesis.

Another theory presented by Jenson (1986) is free cash flow theory that argues that there is a direct link between agency cost and free cash flow. In order to prevent the manager to invest in unprofitable investment or to prevent from unnecessary investment, the principal (share holders) have to incur some supervision cost. So in such condition, companies have to use their free cash flow as source to overcome the agency conflict between share holders and managers and also to eliminate the agency cost.

2.1.6. Bird in Hand Theory: In contrast to the Modigliani and Miller's dividend irrelevance theory, the bird in hand theory says that dividends affect the company's value. Lintner (1956) introduced the bird in hand theory for the first time and after that many studies support this theory. Because of the importance of this theory it has been included in this study to provide some base for the current study. Although it had been presented 60 years ago, but still this theory is of great importance to the modern literature. It is based on the expression that "a bird in the hand is worth more than two in the bush". In simple words, this theory states that investors prefer current dividend

from their investment rather than to invest in such investment that gives them dividend in future because future dividend is uncertain.

Dividend policy is considered to be an unsolved issue in the field of finance. Even after decades of investigations, scholars still disagree on the factors that influence dividend decisions of companies. There are so many studies in the literature which explore the significant predictors of dividend and dividend payout ratio in different countries. Soondur et al. (2016) conducted a study to find out the determinants of dividend payout policy of companies listed on the Stock Exchange of Mauritius. They used dividend per share as dependent variables while, earning per share (EPS), net income (NI), retained earnings (RE), cash and cash equivalent and debt to equity ratio has been used as independent variables. They applied fixed and random effect and the results showed that payout ratio has a significant and positive correlation with liquidity, but negative and insignificant correlation with profitability. Essa (2015) attempted to find out the determinants of dividend policy in context of Malaysia. The sample of his study includes 284 Malaysian firms listed on the Kuala Lumpur Stock Exchange. The data of his study was collected from seven sectors which include consumer products, industrial products, construction, finance, technology, properties, and telecommunication sector. The study found that free cash flow, return on assets, return on equity, earning per share, market to book value and market capitalization have significant positive correlation with dividend at the pooled data level. Bisht, et al. (2015) examined the association between the various factors that can effect on the dividend decision. They used Firm size, beta rate, price to earnings (PE) ratio, liquidity ratio, profitability ratio and retained earnings as factors of dividend. The finding of the study revealed a direct relationship between dividend and profitability.

They further concluded that retained earnings and firm's size have no meaningful association with dividend policy.

Thanatawee (2011) investigated the free cash flow hypothesis the policy of Thai listed companies from 2002 to 2008 in order to test the free cash flow and life cycle hypothesis. He found that the two main variables earnings equity and free cash flow have a positive influence on firm's dividend policy. Further, the results show that the relationship between market to book ratio and dividend payout ratio is significantly negative. The results supported the free cash flow and life cycle hypotheses. On the contrary, however, the coefficient between market to book ratio and dividend yield is significantly positive. The leverage ratio has a positive and significant influence on both dividend payout ratio and dividend yield. Mubin et al. (2014) conducted a study to find out the determinants of dividend in context of non financial sector of Pakistan. The predictive variables for dividend used are earning per share (EPS), cash flow per share (CFPS), last year dividend, leverage ratio, firm size, life cycle and tangibility of assets. The results showed that earning per share (EPS), last year dividend, firm size, tangibility and life cycle have a significant relationship with dividend while cash flow per share and leverage ratio have insignificant relationship with dividend.

2.2 Earnings as a predictor of dividend

There is an extensive literature on the relationship between earnings and dividend. The long term sustainable growth of a company's dividend depends on how well their earnings are growing. The companies with a sustainable earning growth have the capacity to offer a higher payout ratio to its share holders than companies with inconsistent EPS growth rates (Plaehn, 2014). Benartzi, et al. (1997) has conducted a

systematic study to check whether the information content of dividend has some link with the future earnings. They found that changes in divided provide no information about the future earning changes, so the view that "dividend changes have information content about future earnings changes" have been proved wrong. On the other hand they identified that the past earnings changes have a significant link with dividend, but the predictive value of changes in dividends seems minimal. Koch & Sun (2004) identified that the reaction of market at the time of dividend changes is due to previous changes in earnings. The paper uses a sample of prices changes in responses of earnings changes to test the relation of prices changes in reaction to dividend changes. Support for a relationship between earnings and dividend is implied.

Waweru, et al. (2012) provided the empirical evidence that dividend can be used as a signals for a firm's future earnings prospects. They further explained their results that they found no company with a negative EPS that increases dividends. Its means that the dividend increase is solely dependent on the future earnings prospects of the firm. Fama & French (2001) found profitability as one characteristic that can affect a firm's decision to pay cash dividends. They states that cash dividend can be terminated due to negative earnings. So their study clearly indicates an association between cash divined and earnings. McCann & Olson (1994) further provided some detailed evidence about the link between earnings and dividend. Their study supported the dividend payment hypothesis regardless of the perfection of the capital markets.

Fuller & Thakor (2002) concluded that firms pay low amount dividend when their performance is poor because the amount of dividend that a firm gives to their share holders dependent on their past performance. In such condition there is nothing to signal because dividend payment is solely dependent on past performance and also the

problem of large free cash flow is solved by paying high dividend to their share holders.

Board & Day (1989) found that earning has a better predictive ability of future cash flow than current cash flow. The reason is that accounting earning is based on the historical cost and it is the standard measure and most commonly used variable both in past and current accounting literature. Essa et al. (2012) in his study found that both net cash flow and earnings per share have a positive relationship with dividend. Besides net cash flow and earnings per share they also used some other variables (EBIT, price to book value, dividend yield and firm size) and found to be positively related with dividend. They further explained that the impact of large firms on dividend policy is greater than the small firms.

Charitou, et al. (2010) used a sample of US firms in their study and concluded that the information content of current and future dividend varies depending on the pattern of current earnings, past earnings and dividend payment records. They argued that dividend would be reduced if the firm experienced a persistent decline in the past earnings pattern. Lamont (1998) tested the hypothesis that both dividend and earning gives us a signals about future stock return. The result shows that both dividend and earnings provide information about the future aggregate stock return but this information is only for a short period of time. In other words, dividends and earnings are important only for giving information about the term movements in expected returns; however he found that only price contains information about the long term (a period of five years) changes in stock return. The study of Bali et al (2008) provides results that were contrary to the finding of (Lamont 1998). They identified that his results only hold for specific sample period. The results became opposite when an

extended version of sample was used. They found a significant positive relationship between earnings and expected return at firm level.

2.3 Cash flow as predictor of dividend

However there are also some studies in the literature which identified cash flow as better predictor of dividend. Cash flow is considered to be an important factor in determining a firm's value. Many financial scholars give priority to cash flow per share than earning per share because earnings per share value can easily be manipulated, which results in higher positive value of earnings than the actual value which affect its reliability. On the other hand cash flow is more difficult to manipulate which results a more accurate value for cash flow and according to some analysts that makes a particular business model more accurate and strong (Investopedia).

There are few past studies, which did not find significant link between cash flow and dividend changes (Fama & Babiak 1968), (Hagerm & Huefner 1980) and (Simons 1994). They concluded that historical cost is comparatively a better predictor than cash flow and cash flow is insignificant predictor of dividend changes. However their finding was not able to conclusively exclude the impact of cash flow in changes dividend because they used income plus depreciation as a proxy for cash flow which cannot be used for liquidity and it can only be used for describing profitability. Inspite of the above studies, which did not find any link between the dividend changes and cash flow, some of the studies have identified a significant association between dividend changes and cash flow. The first successful study regarding the link between cash flow and dividend was conducted by Bowen et al (1986) in which he found that cash flow has higher significant predictive power than current earnings in predicting dividend changes. After that most of the current studies support the results of Bowen

(1986) studies. However, Dechow etal. (1998) found a positive relationship between earnings and operating cycle of the firms. After that Hodgson & Clark, (2000) identified that both earnings and cash flows have higher information content. They concluded that explanatory power for cash flow is high for large firms. *Gairatjon* (2012) made an attempt to examine the relationship between different company's factors and dividend payout ratios. He selects sex factors which includes free cash flow, growth, profit, leverage, size and risk and test their impact on dividend payout ratio. The study was based on four dividend theories; the bird in hand theory, the dividend irrelevance theory, the signalling theory and agency theory. The relationship among the selected factors and dividend payout policy was tested by applying to it regression and ordinary least square (OLS). The finding of the study indicates that free cash flow, growth and risk have a significant relationship with large size company's dividend payout ratio. While medium size companies dividend payout ratio have a significant relationship with free cash flow, risk, leverage and size.

Stephanus, (2008) investigated the relationship between dividend changes and cash flow in South Africa. A data related to dividend and cash flow was collected from 60 companies listed in Johannesburg stock exchange from 1990 to 2005.

He found a positive link between cash flow and changes in dividend. He also identified a significant positive relationship between dividend changes and earnings after taxes and a significant negative relationship between previous year dividend yield and dividend changes. Al-Najjar & Belghitar (2012) have used a sample of 432 UK firms in order to test the relationship between and dividend policy. The results have shown a significant positive link between cash flow and dividend.

The results described that both operating cash flows and free cash flows can be used to pay dividend. The results of the study supported the Jenson (1986) agency theory of free cash flows. Adelegan (2003) tested his hypothesis that whether cash is a better predictor of dividend changes. A data of 63 Nigerian companies have been used for the analysis. The result of his study has shown that cash flow is a significant determinant of dividend in small sized firms that uses average amount of leverage. Similarly cash flow is a significant predictor of dividend in both high growth firms and low growth firms. Contrary to the above studies that have found a significant association between cash flows and dividend the study of (Sindhu 2014) has identified insignificant relationship between free cash flows and dividend along with a moderator variable (firm size). Brown (1998) studied the relationship between share price, dividend per share and earnings per share of 100 companies listed in Johannesburg stock exchange (JSE). He found that a change in earning per share bring 7% change in the share price. Similarly a change in dividend per share can bring 14% change in share price. After that a similar study was conducted by Mara Tjingaete (2001) in which he investigated the link among share price, dividend per share, earning per share and cash flow per share. The study found that 7 to 8% of the movement in share price was due to the changes in earnings. Similarly change in dividend result a 0 to 6% movement in the share price as while in study of Brown it was 14% movement. The results have identified a comparatively low movement (4%) in share price due to changes in cash flow. (Consler et al, 2011) made an attempt to investigate that whether cash flow per share more accurately predicts the dividend earnings. They used total assets, debt ratio and market to book value ratio, current liquidity and market beta as control variables. Quarterly data for a period of 7 years (2000 to 2006) has been obtained from dividend paying companies from CRSP and

Compustat data. By applying mixed effect model they identified that cash flow is a better predictor for dividend than earning per share, but it was not clearly indentified that how much it is better than earnings in predicting dividend.

2.4 Hypothesis of the study

Most of the past studies concluded a positive link between cash flow and dividend that has already been presented by agency theory of free cash flow (Jenson, 1986). However, the first successful empirical study regarding the link between cash flow and dividend was conducted by (Bowen et al,. 1986) in which he found that cash flow has higher significant predictive power than current earnings in predicting dividend changes. Similarly, Consler, et al. (2011) also found that cash flow per share is better predictor of dividend per share than earning per share. On the basis of above discussion, we construct the first hypothesis of this study which is;

H1: Cash flow per share is better than earning per share in predicting dividend.

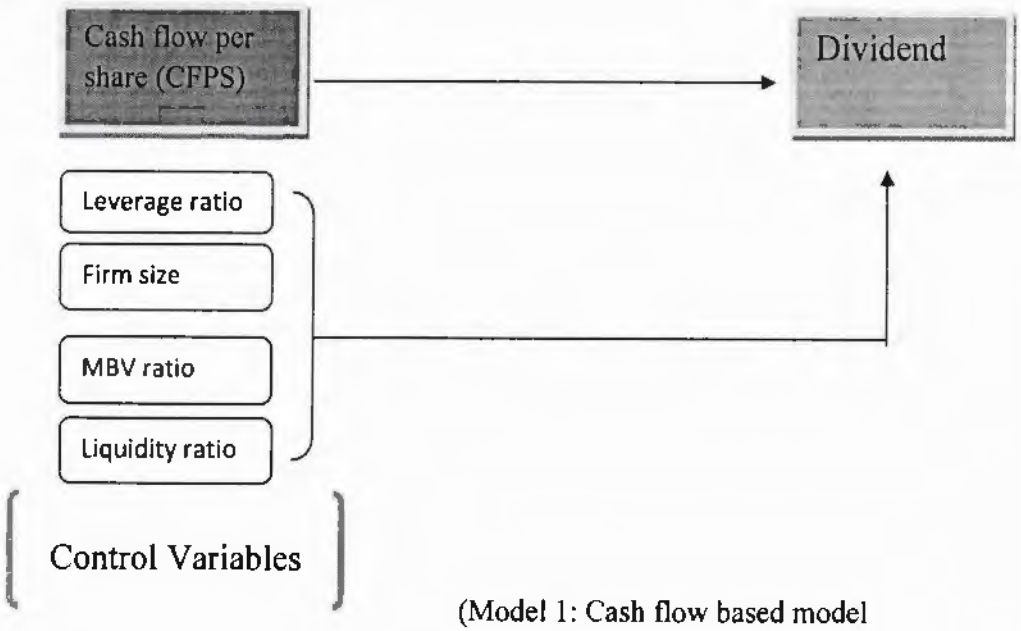
When comparing the two models (earnings based model and cash flow based model) it is also important to test possible relationship of the cash flow and earnings with dividend. According to the literature of our study most of the studies have found a positive significant association between cash flow and dividend. Gairatjon (2012) identified that free cash flow has a significant positive relationship with dividend payout ratio. Similarly Stephanus (2008) has also found a positive relationship between cash flow and dividend changes. So this study will also test the same possible relationship by constructing second hypothesis of the study which is described below.

H2: Cash flow per share has a positive and significant relationship with dividend.

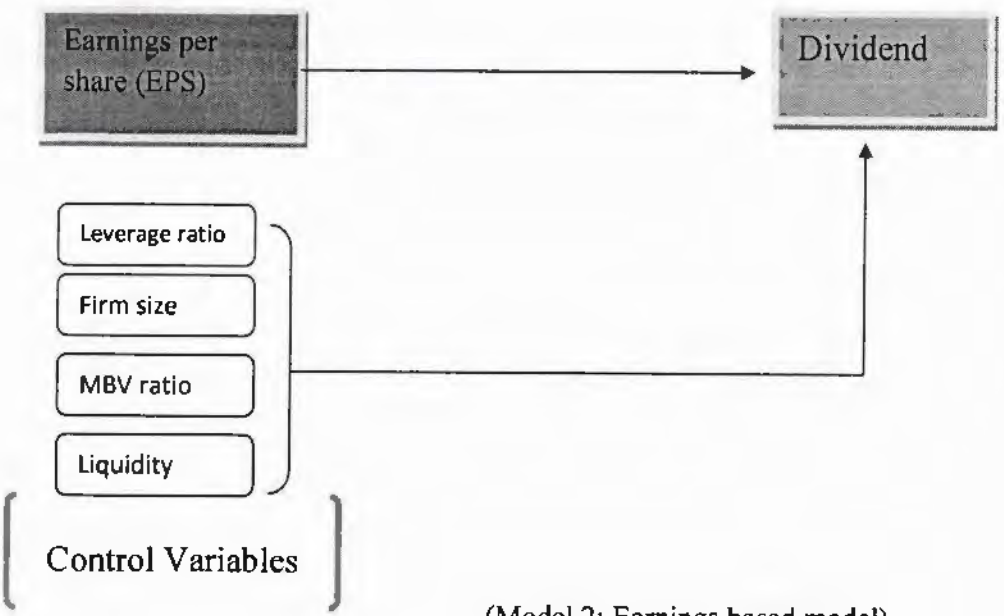
The relationship between earnings and dividend has been studied a lot. According to the previous literature on the relationship between earnings and dividend, it can be concluded that earnings have a significant and positive relationship with dividend. This relationship was supported by Plaehn (2014), who concluded that companies with a sustainable earning growth have the capacity to offer a higher dividend payout ratio to its share holders then companies with inconsistent earning growth rates. Similarly, Essa et al,. (2012) in his study found that both net cash flow and earnings per share have a positive relationship with dividend. Therefore, this study will test the relationship between earning per share and dividend per share by constructing the following hypothesis.

H3: Earnings per share have a positive and significant relationship with dividend

2.5 Conceptual framework



(Model 1: Cash flow based model



(Model 2: Earnings based model)

CHAPTER 3

METHODOLOGY OF THE STUDY

3.1. Research paradigm

This study followed a quantitative research method with a deductive approach. A deductive approach is that in which we based our study on a few theories and then those theories were tested to check that how much our study supports it. So this study is based on three theories, which are Agency theory of free cash flow, dividend residual theory and dividend signalling theory. This is an explanatory research in which the validity of the study will be checked in context of Pakistani economy. In explanatory study, we try to explain phenomena, which have already been studied. Linear mixed effect model has been used for data analysis and for comparing the abilities of earnings and cash flow in predicting dividend. This is a comparative study in which the predictive ability of both earnings and cash flow have been checked to find out that which one is a better predictor of dividend. Two statistical techniques have been applied to measure the relative predictive ability of earnings and cash flow, which are maximum log likelihood estimator (MLE) and Akaiki Information criteria(AIC). The higher the log likelihood number, the higher will be the predictive ability of a variable while lower the value of the Akaiki information criteria shows a high predictive ability of the variable.

3.2. Population and sample of the study

The sample of the study is based on 104 companies, which are mostly from Textile sector, cement sector, energy sector and Pharmaceutical sector. As most of the non financial firms are not offering dividend to their share holders, therefore the sample has been reduced to 104 companies. The estimated period for this study will be 7 years (from 2007 to 2013).

3.3. Type of data

Secondary and balanced panel data has been used in this study. According to Bruderl (2005) panel data is repeated measures of one or more variables on one or more persons. In other words, panel data generates when we use multiple measures for a sample unit (company, individual, country) for multiple time periods. According to Teruel & Solsno (2007), panel data methodology has important benefits. According to the assumption of panel data methodology the country, person and firms should be heterogeneous, which an important benefit. Time series and cross sectional data have the risk of biased results because these studies are not controlling for this heterogeneity. According to Bakatagi (2001) panel data provides more information, more variability, less colinearity among variables more degree of freedom and more efficiency.

3.4. Sources of data

This study has used annual data from balance sheet analysis of non financial sector companies of Karachi stock exchange (KSE). The data of market price has been collected from KSE website.

3.5. Measurement tools and statistical techniques

The data for this study is arranged in excel and after that some statistical software like STATA has been applied. For further analysis, different statistical tools have been used like simple tabulations to test the mean standard deviations, reliabilities. To check the problem of multi-collinearity, an inter-correlation matrix used. Similarly for checking about possible autocorrelation Durbin and Watson test will be used and checking for heteroskedasticity, Breusch Pagan test will be conducted. The two models can be compared on the basis of maximized log likelihoods number and akaike information criterion (AIC). In statistics, maximum-likelihood estimation (MLE) is a method of parameters of a statistical model of given data. In this study both earning based model and cash flow based model have been used. The two models have been compared directly in terms of their maximized log likelihoods and Akaike information criterion (AIC) because they have the same number of parameters. The higher value of log likelihood number means that the model fits the data accurately (Consler et al., 2011). The Akaike information criterion (AIC) is a statistical tool that measures the relative quality of statistical models for a given set of data.

The formula for Akaike information criterion (AIC) is;

AIC= -2 log likelihood number +2 (numbers of parameters) (Sakamoto et al., 1986 and Consler et al., 2011)

3.6. Variables of the study

Dependent variable

Dividend: The portion of company earnings that is distributed among the share holders is called dividend. There are many arguments in favour of dividend payment, as it has already been discussed by the agency theory of free cash flow (Jenson, 1986) that firms pay dividend to eliminate the agency cost. According to The information asymmetry hypothesis the manager has private information about future prospects of a firm and when the manager declared dividend, it give a signal to the investors that the manger is confident about the future performance of the firm (Bhattacharya, 1979) and (John and Williams, 1985). Therefore dividend is considered to be a hot topic for the researchers.

Independent variables

Cash flow per share: This study has used operating cash flow per share as a measure of the overall cash flow. The cash flow which is obtained from the operating activities of the business is called operating cash flow. The data for operating cash flow has been obtained from the balance sheet analysis of sample firms. A firm give their cash dividend from their operating cash flow which is the main source of cash dividend. If firm's management have confident that they have enough operating cash flow in the future then they will not feel any reluctance to pay high dividends. On the other side, if firms are unable to generate sufficient cash flow from operations than management would not be able to increase cash dividend (Mirza and Afza, 2014). There are also some other studies which uses operating cash flow as a predictor of dividend (Liu et al., 2007) and (Consler et al, 2011

Earnings per share (EPS): Earnings per share are the earnings that share holders receive on each of their outstanding share. Earning is considered to an important predictor of dividend. According to Charitou, et al (2010) dividend would be reduced if the firm experienced a persistent decline in the past earnings pattern. Similarly Benartzi, et al (1997) found past earnings changes have a strong and concurrent link with dividend but the predictive value of changes in dividends seems minimal.

Control variables

Leverage ratio (LR): This ratio measures the amount of debt which a firm is using to finance its operations. High debt means that firms have high interest expense, which will lead to a low net income and thus less earning will be available for shareholders. According to (Rozeff,, 1982) high leverage may suffer a firm's financing and investing decisions. A high leveraged firm have more risky earnings and accordingly pay low dividends. Jensen, et al (1992) found that high leveraged firms decreased their dividend which means that the relationship between leverage ratio and dividend is negative and providing support to the free cash flow hypothesis. Similarly Al-Twairjy (2007) also found a negative relationship between leverage ratio and dividend payout ratio and concluded that firms retain more earnings in case of high leverage. Therefore leverage is considered to be an important factor that can affect a firm's dividend policy. Although there are many studies that supported the negative relationship between leverage and dividend policy but according to (Agrawal & Narayanan, 1994) firms that uses high leverage have to pay high dividend payout ratio.

Firm size (SIZE): Size of a firm plays an important role in influencing firms' dividend policy. Large size firms are less dependent on internal finance because they have easy access to financial market and as a result they are in a position to pay high dividend. The transaction cost of large firms is lower than the small firms for raising new financing and pays more dividends (Ali & khan, 1993). Essa, et al (2012) found that large size firms have a greater impact on dividend policy than small size firms.

Market to book value (MBV): The market to book value (MBV) shows the present market value of a company in comparison to its book value. (Essa, et al, 2012) uses market to book ratio in their study and found a positive relationship between market to book value and dividend policy. The market to book value to book value (MBV) is the signal for the shareholders that firms pay dividends smoothly and vies versa (Bleans et al,.2007). So from the above studies it is clear that market to book value (MBV) has a positive link with dividend. According to (Yilmaz & Akben, 2010) market reactions are positive when the firms increase their dividend while market reacts negative when firms decrease their dividend.

Liquidity (LIQ): Liquidity is a measure of the extent to which an organization has cash and cash equivalent to meet its short term obligations. Cash is the key for a firm to pay regular dividend, therefore firms have to maintain strong cash reserve in order to pay dividend. Hence it can be concluded that liquidity is an important factor that contribute to dividend payment (Afza, 2014). Firms pay high dividend when they have stable cash flow and high liquidity as compare to those firms that have unstable cash flow (Amidu, & Abor, 2006). Similarly Kanwal and Kapoor (2008) identified positive link between liquidity and dividend payout policy. He further suggest in case of poor liquidity firms are unable to pay dividend on time. Similarly Gunasekarage &

Power (2006) argued that firms with improved financial position pay high dividend while firms facing financial problems and low liquidity are forced to cut dividends.

3.7. Variables measurement

Dividend: This study have used dividend per share as a proxy for dividend. It is the total dividend including interim dividend distributed or proposed to be distributed out of the current year's profit. It can be calculated by taking the total amount of dividends paid and dividing by total number of shares outstanding (Consler et al, 2011)

Dividend per share = Total amount of dividend paid ÷ Total number of shares outstanding.

Cash flow per share (CFPS):

Cash flow per share = Operating cash flow/ Total number of share outstanding (Liu et al., 2007) and (Consler et al, 2011).

Earnings per share (EPS): It is calculated by dividing the net profit (after tax) by the number of ordinary shares for the year (Mubin et al, 2014).

EPS = Net income (after tax) ÷ Total number of common shares outstanding

Leverage ratio (LR): It can be calculated by dividing total liabilities on total assets (Consler et al, 2011), (Thanatawee, 2011), (Hong & Nguyen, 2014) and (Mobin et al, 2014). The data for total debts and total assets will be obtained from the balance sheet analysis of the firms.

Leverage ratio = Total debts ÷Total assets

Firm size (SIZE): Firm size is calculated by taking natural log of total assets of a firm (Consler et al 2011). The data for total assets will be obtained from the balance sheet analysis of the firms listed in Karachi stock exchange (KSC).

Firm size = log (Total assets)

Market to book value (MBV): It is calculated by dividing average market price per share on book value per share (Consler et al, 2011)

Market to book value = Average market price per share ÷ book value per share.

Liquidity ratio (LIQ): It can be calculated by dividing cash and cash equivalent on total assets (Badu, 2013) and Consler et al, 2011).

Liquidity ratio = Cash and cash equivalent ÷ Total number of share outstanding.

3.8. Research model

This study has used a linear mixed effect model which is basically an extension of linear regression. Mixed effect model can be applied to all those data sets that are collected and summarized in groups. There are two parts of mixed effect model, one is fixed effects and other is random effects. Fixed effect actually tests the relationship between all those independent variables and dependent variables that are within entity (country, person, company etc). According Reyna (2007) are designed to study the causes of changes within a person or entity. On the other hand random effect model assumed that the variation across different entities is random and uncorrelated with

independent variables. If we think that any differences across entities can brings its effect on dependent variable, in such conditions we should used random effect.

3.9. Econometric model

$$DPSij = \beta0 + \beta1CFPSit + \varepsilon\, it \quad (1a)$$

$$DPSij = \beta0 + \beta1CFPS\, it + \beta2\log(TA)\, it + \beta3LR\, it + \beta4MBV\, it + \beta5LIQ\, it + \varepsilon\, it \quad (1b)$$

$i = 1; \ldots\ldots, N; t = 1; \ldots, ni$

$$DPSij = \beta0 + \beta1CFPS\, it + \varepsilon\, it \quad (2a)$$

$$DPSij = \beta0 + \beta1EPS\, it + \beta2\log(TA)\, it + \beta3LRit + \beta4MBV\, it + \beta5LIQ\, it + \varepsilon\, it \quad (2b)$$

Where,

DPS = Dividend per share

β0: The intercept of the model

EPS= Earnings per shares

CFPS= Cash flows per share

Log (TA) = Log of total assets of the firms

LR= Leverage ratio

MBV= Market to book value

Where *i* is the numbers of firms and *t* is the measurement occasion

CHAPTER 4

RESULTS AND DISCUSSIONS

In this study, different statistical techniques and procedures have been used such as descriptive stat, correlation analysis and panel regression measures etc., in order to find out the best predictor of dividend between cash flow and earnings. Before going to data analysis first different tests have been applied to check the assumption of classical linear regression model (CLRM).

4.1. Panel unit root test:

Before analyzing the data it is important to check the quality of data that has been used in this study. There are different tests for checking the quality of data like panel unit root test, multicollinearity test, heteroskedasticity test etc. Many economic and financial time series exhibit trending behaviour or non stationarity in the data. In order to check whether our data is stationary or non stationary, levin lin and chu (2002) unit root test has been applied. The below table shows the panel unit root test of the data which has been used in this study.

The null hypothesis tells that (Panels contain unit roots) while the alternative hypothesis tells that (Panels are stationary). The results show that P value for all our dependent and independent variables is less than (0.05), which means that (levin lin and chu 2002) unit root test is significant for all the variables of this study. Significant results means that we will reject the null hypothesis (Panels contain unit roots) and will accept alternative hypothesis (Panels are stationary). So it can be concluded that the data is stationary. The following table shows the results of unit root test for all the variables.

4.2. Test for Multicolinearity:

When two or more of the predictors in a regression model are correlated, this phenomenon is called multicolinearity. In case of multicollinearity the variance of the regression coefficients increases, which makes them unstable and difficult to interpret. In this study variance inflation factor (VIF) measure has been used to check the multicolinearity in the model. If the VIF value is greater than 10 then multicollinearity exist in the model.

Table 1 (Multicollinearity test)

Model (1b)			Model (2b)		
Variables	VIF	1/VIF	Variables	VIF	1/VIF
CFPS	1.31	0.760959	EPS	1.25	0.760959
SIZE	1.02	0.770035	SIZE	1.02	0.770035
LR	1.05	0.968871	LR	1.06	0.968871
MBV	1.03	0.980406	MBV	1.05	0.980406
LIQ	1.02	0.984614	LIQ	1.23	0.984614
Mean VIF		1.15	Mean VIF		1.12

The overall Variance inflation factors (VIF) value of the 1b and model 2b are (1.15) and 1.12 respectively which means that there are no serious multicollinearity exists in both the models.

4.3. Descriptive statistics:

The descriptive statistic shows the description and summary of the sample data. In simple words, it shows the mean value, standard deviation, minimum and maximum

values of the variables of the study. The following table displays the descriptive statistics of this study.

Table: 2

Descriptive statistic

Variables	Mean	Std- Dev	Minimum	Maximum
DPS	1.073972	5.135558	0	89.80577
EPS	25.02229	61.91434	-298	828
CFPS	2.798494	10.33389	-17.64216	102.8104
SIZE	15.23322	1.551586	9.775938	19.8414
LR	.5346766	.2172146	0	1.937821
MBV	22.31837	63.41338	-105.1263	1063.511
LIQ	.8967016	2.35975	.0021861	40.24565

The mean value and standard deviation value of dependent variable Dividend per share is (1.073972) and (5.135558) respectively. It means that share holder receive an average of 1.07 rupees dividend on their shares. The mean value and standard deviation value of earnings per share (EPS) is 25.02229 and 61.91434 respectively, which indicates that Pakistani firms earn an average of 25 rupees per share. The mean value and standard deviation value of cash flow per share (CFPS) is 2.798494 and 10.33389 respectively which shows that Pakistani firms have an average of 2.79 rupees cash flow per share. The mean value and standard deviation value of firm size is 0.640514 and 1.551586 respectively. The mean value and standard deviation value of leverage ratio is .5346766 and .2172146 respectively. It means that average debt to equity ratio of Pakistani firms is .53. The mean value and standard deviation value of market to book value (MBV) is 22.31837 and 63.41338 respectively which shows that Pakistani firms shares price are 22 times greater than the book value per share. The

mean value and standard d value of liquidity ratio (LIQ) is .8967016 and 2.35975 respectively.

4.4. Correlation analysis:

The correlation analysis is a simple statistical technique which shows the strength of relationship between two variables. When two variables are positively correlated, it means both variables are changing in same direction, while in case of negative correlation; the two variables are changing in opposite direction. A positive correlation means that increase in one variable will bring increase in another variable while negative correlation means that an increase in one variable will brings decrease in another variable. The value of correlation coefficient lies between +1 and -1. The value of coefficient that is close to +1 indicates that the two variables are highly positive correlated, while the correlation coefficient close to -1 indicate that the two variables are highly negative correlated (Keller 2005, p.117). The following table shows the correlation analysis of all the variables of this study.

Table: 3

Regression analysis of earnings based model

	DPS	EPS	CFPS	SIZE	LR	MBV	LIQ
DPS	1.000						
EPS	0.3698	1.000					
	(0.000)						
CFPS	0.5066	0.502	1.000				
	(0.000)	(0.000)					
SIZE	0.0922	0.0843	00489	1.000			
	(0.000)	(0.692)	(1.000)				
LR	0.0440	-0.096	0.0217	-0.054	1.000		
	(0.242)	(1.000)	(1.000)	(0.613)			
MBV	0.150	0.0885	-0.0102	0.008	0.128	1.000	
	(0.000)	(0.000)	(1.000)	(1.000)	(0.029)		
LIQ	0.472	0.4056	0.468	0.0579	-0.093	0.0254	1.000
	(0.000)	(0.000)	(0.000)	(1.000)	(0.434)	(1.000)	

The correlation coefficient between earnings per share (EPS) and divided per share (DPS) is .3698 and p value is 0.000, which shows a positive and significant correlation between earning per share (EPS) and dividend per share (DPS). Similarly, cash flow per share (CFPS) has also a significant positive relationship with dividend per share (DPS). The correlation coefficient is .50 which means that there is 50% correlation between the cash flow per share (CFPS) and dividend per share (DPS). The correlation coefficient between firm size and dividend per share (DPS) is significant relationship. The correlation between leverage ratio (LR) and dividend per share (DPS) is insignificant. The correlation coefficient for leverage ratio (LR) is (0.043) and p value is (0.24) which indicates that there is a weak and insignificant correlation between leverage ratio (LR) and divided per share (DPS). The correlation between market to book value (MBV) and dividend per share (DPS) is significant at 1% significant level. The liquidity ratio (LIQ) has a significant positive relationship with dividend per share (DPS) at 1% significant level. The coefficient value is .47

overall P value of the model is 0.000 and the F value is 76, which mean that the overall model fit is good. The regression coefficient of cash flow is .16 and t value is

The regression coefficient of cash flow per share is .16, t value is 10.31 and p value is 0.000 which indicates a positive and significant link between cash flow per share and (CFPS) and dividend per share (DPS). In other words, it indicates that the ability of a firm to pay dividend increase as the free cash flow increases. According to (Baard, 2007) there is a significant positive relationship between operating cash flow and dividend changes. Similarly, (Afza, 2010) also found that the amount of dividend that a firm pay to its share holders depends on its operating cash flow. So, this whole discussion concludes that cash flow is an important determinant of dividend payout policy in context of Pakistan non-financial sector.

The regression coefficient of firm size is (0.21), T value is (2.21) and P value is (0.047) which shows that firm's size has a significant predictor of dividend per share (DPS). It means that large size firms have the ability to pay high dividend to its share holders in comparison to small size firms. The regression coefficient of leverage ratio is (1.81), t value is (2.47) and P value is (0.043), which shows that has a significant positive relationship with dividend per share (DPS). Similarly the coefficient of market to book value (MBV) and liquidity ratio (LR) are (.006) and (.65), t values are 3.19 and 8.61 and their p values are 0.007 and 0.000 respectively, which also shows a significant association with dividend per share (DPS). It indicates that all the control variables including firm size, amount of leverage, liquidity significantly influence the relationship between cash flow and dividend (Baard, 2007). However, the coefficient of market to book value (MBV) is very low, which means that the influence of market to book (MBV) value on relationship between cash flow dividends is very low.

4.5.2. Regression analysis of earnings and dividend model

The following table shows the regression analysis results of the earnings and dividend model.

Table: 5

Regression analysis of earnings based model

	Coef	t value	p> [t]
EPS**	.024	5.70	0.000
SIZE*	.213	2.11	0.075
LR**	2.47	3.33	0.001
MBV*	.001	2.46	0.036
LIQ**	.812	11.14	0.000
CONS	-4.44	-2.72	0.007
R-squared	0.281	Adj R-squared	0.276
Prob> F	0.000	F (5, 722)	56.48

[Significant at 1% p value **, significant at 5% p value *]

The coefficient of determination R2 for the earning based model is (.329) which means that 33% of the variation in the dependent variable (DPS) has been explained by independent variables (earnings per share (EPS), firm size (SIZE), leverage ratio (LR), market to book value (MBV) and liquidity ratio (LIQ)). The overall P value of the model is (0.000) and F value is 73 respectively, which means that the model fit the data accurately. The regression coefficient of earnings per share (EPS) is (.024), T value is (8.96) and P value is (0.000) which shows that earnings per share (EPS) have a positive and significant relationship with dividend per share (DPS). It means that companies with high earnings have the ability to pay high dividend to its share holders (Plaehn, 2014), while firm size (size), leverage ratio (LR) and market to book value

ratio (MBV) have no significant association with dividend. The liquidity ratio (LIQ) has a significant relationship with dividend. The regression coefficient of firm size is (.18), T value is (1.79) and P value is (0.075) which shows that the relationship between firm's size and dividend per share is significant at 10% significant level.

The regression coefficient of leverage ratio is (2.48), t value is (3.32) and P value is (0.001), which shows that leverage ratio (LR) has insignificant relationship with dividend per share (DPS). This shows that market to book value (MBV) does not influence the relationship between earnings and divided. The regression coefficient of liquidity ratio is (0.81), T value is (11.12) and P value is (0.000) which shows that liquidity ratio has a high positive and significant relationship with dividend per share (DPS). The results supported the previous stidudies of Essa et al, (2012), and Abor and Amidu, (2006). The regression coefficient of market to book value is (0.0016), T value is (0.91) and P value is (0.365) which shows that it has a positive and significant relationship with dividend per share (DPS).

4.6. Linear Mixed effect model

In this study, we have applied a linear mixed effect model of (Pinheiro and Bates, 2000) and (Consler et al, 2011) to both earning based model and cash flow based model. This approach can be used to model population characteristics that are common to all firms, as well as random response patterns that correspond to individual firms over time (Consler, 2011). In this study, the data for cash flow has been taken for 5 years (from 2009 to 2013), because the data was only available for 5 years. Similarly the data for dividend is also missing in some years for a few companies. It means that cash flow and dividend variables does not have 100% balance panel. Therefore, for such data the linear mixed effect model is an appropriate

choice (Consler et al, 2011). Another reason for using linear mixed effect model is that this model had already been used in the study of (Consler et al, 2011) for comparing two models. In order to do analysis of the data, Stata software has been used which is a powerful package for handling panel data. We first started our analysis by applying linear mixed effect model to cash flow based model. Equations (1a) and (1b) present linear mixed effects models for dividend per share (DPS) and Cash flow per share (CFPS). Equation (1b) includes control variables, while equation (1b) is without control variables.

4.6.1. Cash flow and dividend model

Equation 1a and equation 1b shows linear mixed effect model for cash flow and dividend while equation 1b includes control variables.

$$DPSij = \beta 0 + \beta 1 CFPSit + \varepsilon\, it \qquad (1a)$$

$$DPSij = \beta 0 + \beta 1 CFPS\ it + \beta 2 \log (TA)\ it + \beta 3 LR\ it + \beta 4 MBV\ it + \beta 5 LIQ\ it + \varepsilon\, it \qquad (1b)$$

The regression analysis results of both model 1a and model 1b are explained in table 6 and table 7

Table: 6

Cash flow based model without control variables

	Coef	Z	p-value
CFPS**	.2327972	15.84	0.000
CONS	.3567552	2.12	0.034
Log likelihood	-2100	Prob > chi2	0.000
AIC	4202	Wald chi2 (1)	250.93

[Significant at 1% p value **, significant at 5% p value *]

Table: 7

Cash flow based model with control variables

	Coef	Z	p> [z]
CFPS**	.1632214	10.35	0.000
SIZE*	.2155248	2.21	0.027
LR*	1.807700	2.48	0.013
MBV**	.0096620	3.20	0.001
LIQ**	.6251293	8.65	0.000
CONS	-4.45041	-2.82	0.005
Log likelihood	-2054	Wald chi2 (5)	383
AIC	4118	Prob > chi2	0.000

[Significant at 1% p value **, significant at 5% p value *

A linear mixed effect model has been applied to both model 1a (without control variables) and 1b (with control variables). The result of both models shows that cash flow per share (CFPS) has a positive and significant association with dividend per share (CFPS). The results are significant at 1% significance level which indicates a high significant relationship. The coefficient of cash flow in model 1a and model 1b is .23 and .16 respectively which means that for every 1 unit change in cash flow per share (CFPS) brings 23% and 16% changes in the dividend per share (DPS). So we can say that firms with a high cash flow have the ability to pay high dividend as compared to firms with a low cash flow (Amidu, and Abor, 2006). Our results regarding the relationship between cash flow and dividend have been supported by (Mirza snd Afza, 2014) who concluded that the cash flow is an important predictor that can affect the firm ability to pay dividend.

The firm size has also a significant relationship with dividend per share (DPS) because the p value for firm's size is (0.027), which is less than the tabulated value of (0.05). According to (Fama and French, 2001) latger firms have the capability to pay high dividend as compared to small firms. (Essa, et al, 2012) also found that large size firms have a greater impact on dividend policy than small size firms. The relationship between the leverage and dividend payout is positive and significant, which depicts that firms with high debt ratio have to pay high dividend to their share holders. According to Brealey (2001) Debt increases the financial risk and cause shareholder to demand a high return on their investment. The positive relationship between leverage and dividend indicates that Pakistan textile sector, cement sector, energy sector and Pharmaceutical sector are using large amount of debt in order to pay their dividend. It is interesting to see that the amount of leverage has a significant positive relationship with dividend, because most of the previous studies in Pakistan have found a significant negative relationship between leverage ratio and dividend (Afza, 2014) and (Zameer, 2013). However, the results supports the previous study of Aivazian et al, (2003) who documented that that firms in emerging markets appears to be reliant on bank debt for their dividend payments. Similarly the study of (Thanatawee, 2011) and Aivazian et al. (2003) also found a significant positive relationship between leverage ratio and dividend payout ratio. Market to book value (MBV) has also shown a positive relationship with dividend per share (DPS). The result has already been supported by (Essa et al, 2012), who concluded a positive relationship between market to book value (MBV) and dividend policy. The liquidity ratio has a positive and significant impact on dividend per share (DPS), because the calculated p value for the liquidity ratio is (0.000) which is less than critical p value (0.05). The coefficient of liquidity value is (.62), which means that for every 1 unit

change in liquidity ratio a (.62) change in dividend per share (DPS) occurs. According to (Amidu, and Abor, 2006), firms with a stable cash flow and high liquidity are in a position to pay high dividend as compared to unstable earnings. (Kanwal and Kapoor, 2008) also found positive relationship between liquidity and dividend payout policy suggesting that firms decrease their dividend due to shortage of cash and poor liquidity. Similarly (Gunasekarage and Power, 2006) argued that firms with improved financial position pay high dividend, while firms facing financial problems and low liquidity are forced to cut dividends.

4.6.2. Earnings and dividend model

The following two models (2a and 2b) show the cash flow based model. Model 2a is without control variables while model 2b is with control variables.

$$DPS_{it} = \beta 0 + \beta 1 EPS_{it} + \varepsilon_{it} \quad (2a)$$

$$DPS_{it} = \beta 0 + \beta 1 EPS_{it} + \beta 2 \log (TA)_{it} + \beta 3 LRit + \beta 4 MBV_{it} + \beta 5 LIQ_{it} + \varepsilon_{it} \quad (2b)$$

The results of both model 2a and model 2b are explained in table 8 and table 9.

Table: 8

Cash flow based model without control variables

	Coef	Z	p> [z]
EPS**	.0243762	10.74	0.000
CONS	.38877	2.10	0.036
Log likelihood	-2160	Prob > chi2	0.000
AIC	4322	Wald chi2 (1)	115

[Significant at 1% p value **, significant at 5% p value *]

Table: 9

Cash flow based model with control variables

	Coef	Z	p> [z]
EPS**	.0132482	5.73	0.000
SIZE*	.2163397	2.12	0.034
LR**	2.475021	3.34	0.001
MBV*	.0016292	2.47	0.013
LIQ**	.8128265	11.19	0.000
CONS	-4.83736	-2.93	0.003
Log likelihood	-2093	Wald chi2 (5)	284
AIC	4196	Prob > chi2	0.000

[Significant at 1% p value **, significant at 5% p value *]

The results of both model 2a and 2b show a positive and significant relationship between earnings per share (EPS) and dividend per share (DPS). The results are significant at 1% significant level which shows a high significant relationship between earnings per share (EPS) and dividend per share (DPS). In other words firms with high earnings capacity have to pay high dividend to their share holders. The results are consistent with the study of (Plaehn, 2014) who stated that companies with growing earnings have the capacity to offer a higher dividend payout ratio to its share holders than companies with inconsistent EPS growth rates. In another study of (French 2001), firms with negative earnings terminate their dividend. Therefore it can be concluded that in Pakistan earning is also an important predictor of dividend (Ahamd and Javid, 2012). The size of firms has also a positive and significant relationship with dividend per share (DPS). Firm size is an important factor in dividend policy of Pakistani firms because firms with large amount of assets have the ability to pay high dividend to their share holders (Afza, 2014). Similarly, the leverage ratio (LR), market to book value (MBV) and liquidity ratio (LR) have also a positive and significant association with divided per share (DPS). According to Agrawal and Narayanan

(1994) firms with high leverage ratio have a high payout ratio. The reason behind this is that higher leverage firms' improves their ability to pay more dividends because firms that finance their operation and management activities through high borrowing constraints. According to Jensen (1986), the free cash flow is a major determinant of the dividend payouts. Jensen states that this is due to the agency costs connected to free cash flows and shareholders prefer cash payments in the form of dividends rather than to keep the free cash flow within the company. Managers should therefore pay excessive free cash flows as dividends in order to reduce the agency costs. But free cash flow is far from being the only factor that may affect the company's dividend payouts.

4.7. Checking the relative predictive ability of earnings and cash flow

There are different statistical techniques to compare two models like log likelihood estimator, Akaiki information criteria (AIC) and likelihood ratio test. However we cannot apply likelihood ratio test directly, because the two models are not nested. So, non nested models can only be compared by using log likelihood estimator and Akaiki information criteria (AIC) (Consler et al, 2011). The Akaiki information criteria (AIC) value can be calculated by the following formula.

AIC = -2*log likelihood + 2* Number of parameters (Sakamoto et al., 1986) and (Consler et al, 2011)

The model with higher log lielihood value and lower AIC value is considered to be the best fit model. The table 7 shows that the log likelihood value for cash flow model (without control variables) is -2100 and AIC value is 4202. Similarly, according to model 8 the log likelihood value for cash flow based model (with control variables) is -2054 and AIC value is 4118. Similarly table 9 shows that log likelihood value for

earning based model (without control variables) is -2160 and AIC value is 4322. Table 10 shows that log likelihood value for earnings based model (with control variables) is -2093 while AIC value is 4196.

The results show that cash flow based model is a better fitting model for the available data because the log likelihood value of the cash flow based model is higher than the earnings based model and the AIC value for cash flow based model is lower than the earning based model. So we can say that cash flow more accurately predicts the dividend than earnings. The results of this study are according to the previous study of (Consler et al, 2011) who concluded that cash flow is a better predictor than earnings. This study also supported the arguments of (Healy, 1985) that cash flow is better than earnings because manager can easily manipulate earnings for their self benefit.

4.8. Testing of Hypothesis

The hypothesis of this study has been tested on the basis of the above-mentioned results. The following is the first hypothesis of the study.

First Hypothesis

H1: Cash flow per share is better than earning per share in predicting dividend.

The model with a high log likelihood number and low Akaiki information criteria (AIC) value is considered to be a best fit model. The log likelihood value for cash flow based model without control variables is (-2100) while for earnings based model, it is (-2160). Similarly, the Akaiki information criteria (AIC) value for cash flow based model is (4202) while for earning based model is (4322). The log likelihood value for cash flow based model with control variables is (-2054) while for earnings based model, it is (-2093). Similarly the Akaiki information criteria (AIC) value for

cash flow based model is (4118) while for earning based model is (4196). So, on the basis of the above results, the cash flow based model is considered be better fitted model than earnings based model. It shows that cash flow is a better predictor of dividend than earnings (Healy, 1985) and (Consler et al, 2011). So, the first hypothesis of the study is accepted.

Second Hypothesis:

H2: Cash flow per share has a positive and significant relationship with dividend.

The results of both regression model and the linear mixed effect model show a positive and significant association between cash flow per share (CFPS) and dividend per share (DPS). It means that cash flow is a major determinant of dividend policy of non-financial firms of Pakistan. Firms that generate a large amount of cash flow have the capability to pay more dividends to their share holders. The results supported the agency theory of Jensen (1986), who found that management of firms pays high dividend to their share holders if they have high reserve of free cash flow, so that the agency conflict is reduced.

Third hypothesis:

H3: Earnings per share has a positive and significant relationship with dividend

The regression model results and linear mixed effect model results also display a positive and significant relationship between the earnings per share (EPS) and dividend per share (DPS). So, it can be concluded that firms with high earnings have the ability to pay high dividend. In other words dividend would be reduced if the firm experienced a persistent decline in the past earnings pattern (Charitou et al, 2010). The results also supported the residual theory of dividend (Lintner, 1956) which states that

retained earnings can be used as a source to pay dividend after all future investment opportunity has been financed. We can also relate our findings to the signalling hypothesis of Bhattacharya (1979), who stated that dividend can be used as a signal for future cash flows.

CHAPTER 5

CONCLUSION

This study investigated to compare the relative predictive power of cash flow and earnings and to find that whether cash flow is better than earning in predicting dividend. Panel data has been used in this study, because panel data is more efficient and has less collinearity. The data has been collected from balance sheet analysis of KSE 100 index for 7 year (2007 to 2013).The sample includes 104 companies from textile sector, energy sector, pharmaceutical sector and cement sector. In the first step, we apply different statistical techniques like unit root test, variance inflation analysis (VIF) test and Bruesh pagan test in order to check the quality of data. After that some other statistical techniques like correlation analysis, OLS regression, and linear mixed effect model have been applied for data analysis. The results of the correlation analysis shows that earning per share (EPS), cash flow per share (CFPS), market to book value (MBV) and liquidity ratio has a positive and significant relationship with dividend per share (DPS), while leverage ratio (LR) have insignificant relationship with dividend per share (DPS). The results of regression analysis indicate that cash flow per share (CFPS) and earnings per share (EPS) have a significant positive relationship with dividend per share (DPS). The results supported the previous study of (Essa et al, 2012), (Afza 2014) and (Consler et al, 2011). The results also support the free cash flow theory of jenson, (1986), who argued that managers give their free cash flow as dividend to share holders in order to decrease the agency conflict between the manager and share holders. Similarly, all the control variables; firm's size, leverage ratio (LR), market to book value (MBV) and liquidity ratio (LIQ) have a significant positive relationship with dividend per share (DPS). The relationship

between earnings per share (EPS) and dividend per share (DPS) has been positive and significant, which indicates that firms with high earnings have to pay high dividend than low earnings companies (Plaehn, 2014). Similarly all the control variables have a significant effect on the dividend per share (DPS) in both earnings based model and cash flow based model.

To test the first hypothesis of this study the two models (cash flow-based model and earnings-based model) have been compared on the basis of their log likelihood estimator value and Akaiki information criteria (AIC) value in order to select the best fitted model and best predictor of dividend (Consler et al, 2011). The results indicate that cash flow is better predictor than earning in context of Pakistan non-financial sector. So, the first hypotheis *(H1: Cash flow per share is better than earning per share in predicting dividend) has been accepted.* The results supported the previous study of (Consler et al, 2011) and (Healy, 1985), who concluded that cash flow is a better predictor of dividend than earnings. Just like regression model the linear mixed effect model has also shown a significant relationship between cash flow per share (CFPS) and dividend per share (DPS). So, the second hypothesis of the study which is *(H2: Cash flow per share has a positive and significant relationship with dividend per share)* has been accepted. Similarly, earning per share (EPS) has also a positive and significant association with dividend per share (DPS). The results give us enough indication to accept the third hypothesis of the study which is, "*Cash flow per share has a positive and significant relationship with dividend per share*".

From the above discussion it can be concluded that although both cash flow and earnings are significant predictors of dividend but still cash flow is relatively a better predictor of dividend than earnings in term of its relative predictive ability.

5.1. Limitation of the research study

The following are the limitations of the study;

i. This research study is limited only to non-financial sector of Pakistan.

ii. This study is limited to the time frame from 2007 to 2013

iii. This research study has used a sample of only those firms whose data was available and accessible.

iv. The comparison techniques which have been used in this study do not indicate that whether cash flow is significantly better than earnings in predicting of dividend because the results do not shows how much the cash flow is better than earning.

5.2. Recommendations

This research study suggest following recommendations.

This study recommends to the academic researchers and business practitioners, that both cash flow and earnings are significant predictors of dividend policy in non financial sector of Pakistan. However while setting up dividend policy the managers that make dividend decision should give more importance to cash flow as compare to earnings because cash flow is relatively a better predictor of dividend than earnings (Consler et al, 2011). This study also suggests that to test some other control variables that can influence the relationship of cash flow and earnings with dividend. According to Thanatawee (2011) firms with rich cash tend to have overinvestment problem, so in that condition managers increased their dividend which results in a positive stock market reaction. Therefore this study also recommends that share holders should get information about a firm's cash flow before investment.

5.3. Future Research directions

The following areas can be explored for future research studies;

i. Future study should use different measures for cash flow and earnings to check the relative predictive power of both variables.

ii. Future study should use other approaches in order to address the issue of magnitude raised here.

iii. Future study should use a large sample size and greater time duration to check the relative predictive power of earnings and cash flow in predicting dividend.

iv. Future study can be taken to do comparative analysis among various economies results and to find out a better predictor of dividend.

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