INFLUENCE OF MARKET POWER AND MARKET COMPETITION ON EARNINGS MANAGEMENT: EVIDENCE FROM ACCRUAL BASED ACTIVITIES IN FOOD INDUSTRY

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Abstract

This study aims to provide guidance to the investors and managers for making prudent and informed investment decisions by developing an understanding about the influence of market power and market competition on the earnings management particularly in the food industry of Pakistan. It provides insights on the likelihood of discretionary accruals applied by the firm's management in order to accomplish the annual objectives and make the firm's image better from investors' point of view. The study employs panel regression analysis along with two models of fixed and random effects to evaluate the impact of market power and market competition on the earnings management on the dataset of 17 publicly traded Food companies of Pakistan over the period from 2009 to 2018. The findings suggest that there is a substantial positive impact of market power on the discretionary accruals whereas a substantial negative relationship found between the market competition and discretionary accruals for food industry of Pakistan. This is to the best of our knowledge, first of its kind endeavor—particularly for the food industry and provides a good piece of firsthand informative material for managers and investors to perceive the nexus of market power, competition versus earnings management in case of Pakistan.

Keywords: Food Industry, Earnings Management, Discretionary Accruals, Financing Decisions, Investment, Pakistan.

INTRODUCTION

In recent times financial scams and global recession has increased the significance of how corporate managers manage the earnings to achieve their objectives and goals. This also raised the importance of understanding the concept of earnings management. Earnings are described as the net profit in the presented financials of the firm, earned in the specific period. It defines how company adds value to the company's funds and increases the wealth of the shareholders (Anjum et al.,2012).

In corporate world, investors tend to seek firm financial information that helps them to foresee future firm performance. Financial reports commonly used to obtain the required financial information for existing firm performance including past trend. However, corporate managers use to manipulate financial information to revamp the financial position of the company for their own interest, such practice is called earnings management (Bodie et al., 2014). Therefore, earnings management refers to an approach for the firms to manage the corporate profits by applying flexible accounting rules and practices. This strategy supports to maintain a stagnant profit trend over multiple years instead of large fluctuations. Various studies suggest that, corporate managers are usually involved in earnings management because of two reasons, firstly their compensations are depending on corporate profits and secondly to accomplish the company's standards and bank loans (Dye, 1988; Almadi and Lazic, 2016).

Several researches argued that there is a substantial association between the CEO inducements and the earnings management. A research is done by (Almadi and Lazic, 2016) which found that bigger firms are usually more prone to manage the earnings by manipulating current accrual models to overstate the

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earnings as compare to the small firms. This study highlights that the size of the organization affects the practice of earnings manipulation activities (Akram et al., 2015). Few researchers also found that the market power and market competition have strong relationship with earnings manipulation (Datta et al., 2013). Market power can be described as corporation's capability to manage the prevailing price of a commodity by controlling and manipulating the quantity of supply and demand. Usually growing business attracts the investors as high returns are expected but if a firm failed to achieve its annual targets, then usually share price of the firm starts declining due to losing the market and investor's confidence (Bodie et al., 2014). On the other side, market competition provides a challenging environment for those firms who are weakly managed. According to a research, it is found that earnings management is high in highly competitive environment (Datta et al., 2013). Some evidence demonstrated that there are high incidences of earnings manipulation where there is high competition. Therefore, it is found necessary to report satisfactory earnings and firm performance to the shareholders to show a positive image of the firm to meet the analysts' forecasts (Kordestani and Mohammadi, 2016; Markarian and Santalo, 2014). It is found that the shareholders usually get more dividend or earning share in a high competition industry as compared to lesser one (Marciukaityte and Park, 2009).

According to a study, there are two accounting methods for earnings management by the firms' management, that is Real Activities and Accrual based Activities. There are further two categories of Accrual Based Activities: discretionary and non-discretionary (Schipper, 1989). Some studies suggest that corporate managers prefer accrual-based activities as it supports the managers to mend the company's future progress and to secure bonus and incentives (Moradi et al., 2015).

Such accrual-based incidences to manage the firm's earnings, mostly includes the estimation of useful life of plant and equipment, residual worth of fixed assed, method of accounting, depreciation policy, estimation for doubtful debts, and other various methods for costing, investment and estimation allowed under the generally accepted accounting principles (GAAP) (Heidarpoor and Habibipour, 2015). This study primarily investigated the use of various accrual-based activities by exploring the different variables to examine the influence of market power and market competition.

One more similar research done on Kuwait market to investigate the relationship among the variables by using current accrual model versus total accrual model and it is found noteworthy relationship among earnings management and firm's financial progress while considering current accrual however insignificant relationship found while applying total accrual model (Algharaballi, 2013; Akram et al., 2015).

Several studies have been done to probe the association among market power with earnings management and market competition and earnings management. This study is different as it focused particularly on the food industry of Pakistan, one of the fastest growing industries that had also registered a significant contribution in economy strengthening and have a good share in GDP of the county as well (Economic Contribution of the Food and Beverage Industry, 2017). As in recent past, a lot of reformations (large scale production, advanced and quick production machinery, digital system, improved shelf life with better packaging, door step delivery and many more) have been done in this industry and it has grown many times in past decades, and successfully attracted a lot of investors to explore the importance and potential of this industry. As the size expanded, the competition between the firms also increased that leads to the concept of earnings management. Similarly, companies in this industry with the large market share avails the market power benefits to play with the product pricing strategy that also impact the earnings management.

Thus, this study explored the relationship of earnings manipulation on market power and market

competition simultaneously by analyzing the use of accrual-based accounting in food industry. To the degree that the earnings management can mislead the transparent view of financial reporting, our research can primarily help the investors to understand the product market power and market competition and its impact on the tendency of earnings manipulation by firms' managers. This could help the investors to get some understanding about the real numbers behind the reported earnings, to make a better investment decision. Moreover, while making financing and investment decisions, the investors must understand the relationship of competition and market power with the earnings management as discussed in this study.

Upcoming sections of this study are divided as: In section 2, there is background literature and hypothesis development. Thereafter, section 3 presents research methodology, sampling, research models and equations for earnings management with regards of market power and market competition. Section 4 presents data analysis, empirical findings and regression analysis on the selected variables of industry and firms. Section 5 we concluded with the results, limitations and future suggestions along with the recommendations for the investors.

LITERATURE REVIEW

Earnings Management

Actual economic performance of an organization is masked by the process of Earnings management (Khan and Akter, 2017). Many studies have been conducted to explain the concept of earnings management in various contexts quoted by Mostafa (2017) as "*Managers may want to report higher earnings than actual when their operating performance is below the expected or tolerated level. This will lead them to manage income*".

Company's management use various methods to workout earnings management that are usually accepted accounting methodology and are designed with the goal of operating the company's earnings (Dechow et al., 1995). Some of the stakeholders may get fabricated by accounting techniques about the company's performance and provide loan agreements to the firm on the basis of stated financial statement (Nisar, 2009; Sambharya, 2011). For revenue smoothing, earnings management is significantly used by the company, which helps to stable income and expenses that occurs all over the year to fulfill fixed income. Most of the times inappropriate earnings are recorded in company's financial numbers that can harm the stockholders of the firm, who may purchase overestimated shares or selling underrated shares that depends on these types of incomes, resulting in unnecessary losses (Katmon and Farooque, 2017; Martínez-Ferrero et al., 2016).

Companies that are forced to obtain bank loans to run the operations, have high preference to practice earnings management policy to safeguard their revenue to fulfil values that are identified by the financing agencies in the agreements that are contract based (Cheng et al., 2015; Schipper, 1989; Healy and Wahlen, 1999). The extensive use of accounting information by financial experts and shareholders to increase the value of shares and encourage managers to manipulate earnings and revenue in order to motivate temporary price performance and overlooking the long-term results of this practice. A survey conducted in which more than 400 CFO's are included which shows that 73.5 percent of the CFO's were ready to forgo the long-term benefits on the cost of short-term earnings to preserve and enhance their company's share value (Graham et al., 2015).

According to the past researches, outcomes divides the researcher in two groups, one supports the earnings management, whereas the other group does not support the use of earnings management (Akram et al., 2015). First group says that the earnings management increases the financial performance of the

firm and ultimately it urges the investors to invest. However, second group argue that the use of earnings management creates difficulties to raise the financing for the firm that ultimately hamper the financial performance of the firm (Akram et al., 2015).

Depending on the market situations, sometimes environment pressurized to manipulate the earnings for the stakeholders' benefits. When acquisition is followed by equity-finance, the acquirer is more interested for the overstated financials, where a comprehensive audit can be conducted to highlight or confirm such overstatements (Lennox et al., 2018). A study questioned about the reliability and the quality of the financials if there is manipulation involved by the managers, therefore, it is suggested in a study that these kind of dynamic reporting decisions and policies could be well explained in the corporate disclosure to safeguard by the stakeholders (Beyer et al., 2019). In another study, there are several macro-economic factors that force for the changes in the accounting estimations; this has been observed in the firms that are in financial crises (Ghosh and Siriviriyakul , 2019).

According to past studies, different researchers investigated various factors that can impact the firm's profitability like financial leverage, firm size, and firm's cash operating cycle, capital structure, working capital condition, discretionary accruals, investment position and other various factors (Akram et al., 2015). The researcher further elaborated in his study that there are mainly two approaches to execute earnings management i.e. *"real earnings management and accrual-based earnings management".* But now days, due to the use of accrual system, most of the firms are using accrual-based accounting that leads to the discretionary accruals (Akram et al., 2015).

According to a study conducted on Food and allied industries of Bangladesh to examine the existence of earnings management, most of the companies are manipulating the earnings for more than one year (Khan and Akter, 2017). A research on food industry of Italy on 522 companies reveals that the industry is the one with a higher percentage of "low probability of manipulation" i.e. (59%) as compared to other four industries - Textile, Clothing, Automotive and Metallurgic Industry (Paolone and Magazzino, 2014).

It is found that there is a mix relationship between earnings management and organizational performance. In Pakistan significantly negative relationship found whereas in Indian market there is insignificant relationship between earnings management and organizational performance (Akram et al., 2015).In various other studies, it is observed that those firms that have past positive earnings trend are more involved in earnings management to maintain continues growth trend(Khan and Akter, 2017). Similarly, by (Khan and Akter, 2017) as far as continuity is concerned, majority companies manage their earnings for more than one year. As per Beneish (2001), it is suggested that "debt contracts, compensation agreements, equity offerings and insider trading as four important incentives or motivator for income" are more likely to manipulate the earnings in the firm. In the research, some major motives of earnings management found like "*Political costs, personal incentives, regulatory motives as well as internal motives*" (Rahman et al., 2013). He further found that earnings management are done by changing the process of accruals, that is known as accrual-based earnings management whereas when this is done by changing the regular activities of operation then it is considered as real earnings management (Enomoto et al., 2015).

On a negative side, some managers misuse the concept of earnings management and manipulate the financial information by taking negative advantage of discretion granted to managers, thus deteriorate the quality of financial information, hence resulted as the negative effect on resource allocation (Kheng Soon , 2011).

Market Power

Literature widely supports the concept that competitive pressure is a critical factor for managerial decision making. Various researchers have discovered that the product market environment influence various firm's decisions like financing, investment, profitability forecast, corporate strategies, cash distribution, asset management and other risk management related decisions (Datta et al., 2013). However, various studies have been done to explore the ways by product market power influence the decision to manage the reported earnings of the firm.

Till 2011, a potentially significant connection of product market power and earnings management was remained unexplored. Then a study done to examine the degree of influence of product market power and earnings manipulation by the firm's management and the transparency of reported financial statements of the firm by inspecting a comprehensive sample of 43,628 firms and for the period of 1987 to 2009 and it is claimed to be the first study to examine this relationship between product market power and the firm's earnings management. It is found that product market power is a critical determinant to explore the transparency of corporate earnings (Datta et al.,2013). It is further elaborated that the firms will low product market power are more prone towards discretionary earnings manipulation that suggests that there are some concerns over the transparency on the firm's financial reporting. This finding further validates that where there is high market power has ability to transfer the cost shocks to the customer, hence has low requirement for earnings manipulation in reported financials (Datta et al.,2013).

By definition, a company's ability to affect the value or quality of a commodity or services by controlling the market in demand and supply of the product is called market power (Chang et al., 2018). Many previous studies have shown that earnings management is associated with the product market pricing power and market competition (Datta et al., 2013; Markarian and Santalo, 2014). It is also found in a research done in Chinese and Taiwanese tourism industry on 60 publically traded companies that less earnings management is required where there is high market power, however it varies country to country depending on the prevailing government regulations (Chang e t al., 2018).

Some researchers investigated this topic and their results varied from each other. The companies with more market power having more settled cash flow statements, which leads to fewer variations in share values (Kale and Loon, 2011). It is also found that when a company has strong market power, it can play with the prevailing prices of the product. If a firm possesses high market power and if there is a sudden increase in cost of the product, the company increases its product prices to pass the burden on customer (Kale and Loon, 2011). By this way, companies maintain a stable level of profit and cash flow, which resulted in low degree of cash flow instability (Kubick et al., 2015). In a research it is investigated that the companies with high market power are involved in less real activity earnings management, these types of companies are using accrual-based earnings management (Mitra et al., 2013).

As discussed above, a study found the relationship between market power and discretionary earnings management. The researchers found that the firms with less market power are involved in higher discretionary accruals (Datta et al., 2013). Further, the firms with low market power are more likely to manage incomes to fulfill the market expectation on the company's share prices. According to an investigation conducted on the relationship between Market Power and Earnings management in Tehran on 111 listed companies, suggested that product market power has a negative impact on incidences of earnings management (Heidarpoor and Habibipour, 2015). Product market power is mostly used by financial experts in assessing prospects of company.

According to a study, a natural hedge is provided by product market power that works to smooth out the specific fluctuations of the firm. In their research, they found a negative relationship between

market power and firm specific volatility. It is further suggested that higher market power decreases the doubts about investor's information that resulted as lower stock return volatility (Gaspar and Massa, 2006).

Uniqueness, greater product differentiation, strong brand and superior product portfolio of a firm confers a competitive product pricing edge in the market and can have number of advantages. Firms with greater pricing power and efficiently manage their earnings by transferring the cost shocks to the customers that leads to the more inelastic demand curve for the firm's products (Datta et al., 2013). Such better firm profitability ultimately requires low earnings manipulation and hence provides better quality and transparent financial reporting.

Market Competition

As per definition, a rivalry in which each competitor tries to overcome the other seller in terms of sales, profit and market share, by convincing the customers with more appealing combination of price, quality and services (Chang et al., 2018). It is found that if the industry has high competition it will lead to greater degree of Earnings management (Datta et al., 2013). Some other studies suggested that if companies are highly pressurized by competition then they are less expected to fully disclose their earnings information. This type of modification is mostly imperative for firms that underachieved in the competitive market (Miloud, 2014).

In consistent with above, if the market competition is high it results in high frequency of earnings operations, because companies tend to show positive market value through recording suitable revenues (Kordestani and Mohammadi, 2016; Markarian and Santalo, 2014). In contrast with above, some evidences show that the companies which are facing less market competition are more tend to manage their earnings, because the results of missing earnings objectives are more aggressive in less competition environment that those facing a higher competition in market (Laksmana and Yang, 2015). In an investigation on various measures of earnings management in relation with market competition, it is suggested that there are severe consequences of missing the financial targets in the low competition firms than the higher ones therefore low competition firms are more inclined towards earnings management (Laksmana and Yang, 2015).

Moreover, Debnath (2017) describes that the companies which are facing continuous development are tend to conduct discretionary growth, because industries required stakeholder's funds to fulfill their growth tendency. In addition, it is analyzed that china and Taiwan discovered one of the most highly developed businesses in the area of Tourism industry (Chang et al., 2018). Several researches demonstrated that highly competitive product market have a negative relationship with the incentive plans of the company and create internal inefficiencies, hence leads to higher incidences of earnings management (Horn et al.,1994).

According to a comprehensive research done at manufacturing sector on 1,667 firm of USA, where it is found that in more competitive environment, firms are less likely to engage in earnings management activities but are more engaged in earning smoothing to improve the future cash flows (Marciukaityte and Park, 2009). It is further suggested that where firms engaged in misleading earnings management in a competitive industry, it is dealt more aggressively with worse consequences when market understand the misleading information by the management. Moreover, product market competition is a useful tool to improve the quality and reliability of financial reporting that also reduce the manager's influence on the financial information. Hence product market competition resulted in improved reporting quality with cost reduction due to less violation of government regulations and corporate governance (Marciukaityte and

Park, 2009).

Discretionary / Non-discretionary Accruals

Non-discretionary accrual is explained as the pre-booking of compulsory expenditure that has to be recognized, but those are already recorded in the company's financial statements like salaries / bonuses or taxes which are to be given in future (Chang et al., 2018). Accrual activities management vary from industry to industry but can have a favorable impact in current period on the cash flows of the firm, but having a bad impact in the future or in long run (Roychowdhury, 2006).

According to research conducted in Tehran who stated that earnings management is arises when the firms' managers employs their decisions to manipulate the financial reporting figures to obtain a favorable view of stockholders about the financial performance of the company (Heidarpoor and Habibipour, 2015). When various assumptions applied to enforce accrual-based accounting by the firms' managers to evenly distribute the cash flows or to show an optimistic view of the financial reporting of the firm, is called accrual-based activities (discretionary accruals) that led to earnings management (Heidarpoor and Habibipour, 2015). A study suggested that just one earnings manipulation method, it is not possible to describe overall consequence of earnings manipulation activity. Managers are not depending only on accrual management to manipulate earnings (Fields et al., 2001).

Moreover, a relationship between bank performance and the management was analyzed and it is found that managers are involved in aggressive earnings management to enhance the bank performance (Neffati et al., 2011). Some previous studies show that the profitability ratios are frequently used as a measures used for finding out financial performance. These ratios such as return on assets or investment, return on equity are also influenced by the earnings management (Hoskisson and Busenitz, 2017). It is also found that to achieve the economic goals and to enhance firms' performance, managers are more inclined towards earnings manipulations (Akram et al., 2015). The evidences of the empirical research also found that there is a strong association between earnings management and the organizational performance (Iatridis and Kadorinis, 2009; Allayannis and Simko, 2010).

Managers tend to use earnings management to enhance company performance, raise their compensation and meeting or exceeding the forecasts of financial analysts. Hence research shows that those firms face higher leverage, lower profitability and growth decline that use aggressive earnings management (Iatridis and Kadorinis, 2009). In another research on the relationship between accruals and the firm performance, there is negative relationship found but at the same time a positive association is indicated when considering future year profitability (DeFond and Park, 1997). That is also a reason to manipulate the earnings in current years to the cash flows for the future years. It is also found that the firms that report a stagnant earning trend, attracts more investors as it such in such firms' investments seems less risky from investment point of view, consequently grasp more shareholders' confidence (Akram et al., 2015).

An investigation done between the two important Asian markets that is Pakistan and India to analyze the relationship between the earnings management and the firms' performance so it is found that though India is a big market, having greater market capitalization, large industry size, and bigger firms but having a little impact of earnings management on firms' profitability. Whereas Pakistan being a small market capitalization and small firm sizes but having significant role on firms' profitability by the earnings management (Akram et al.,2015).

Hypothesis Development

Financial reporting is a key source of information for every investor and decision maker whereas earnings manipulation distort the true picture of the firm's true economic performance and ultimately disrupt the purpose of financial reporting. There are number of studies that argue about the relationship between product market power and competition with discretionary accruals as earnings management (Akram et al., 2015; Anjum et al., 2012; Algharaballi, 2013). Some studies argue about the significant positive relationship while some found negative relationship between the variables as discussed in the above literature. This suggests that this relationship varies with the industry to industry and with the country to country as well depending on the regulation policies and practices. From the above literature review and discussion, following two hypotheses are tested:

***H1*:** Firms with greater product market pricing power relative to other firms in the Food Industry use less discretionary accrual-based earnings management.

H2: Firms in a more competitive market in the Food Manufacturing industry use greater discretionary accrual-based earnings management.

As proposed above, in this study we examined the impact of market power on discretionary accruals that manager's use in a firm to manage the annual earnings by considering the different industry specific variables. Secondly, we also evaluate the relationship of market competition with the discretionary accruals as mentioned in H2 hypothesis. As discussed above, various researches have conducted to discuss this relationship. Their outcomes show mixed results and it can be summarized as this relationship varies with the industry, culture and practices, country's economic condition, people's buying behavior, government rules and regulations. Our study investigated this relationship in the dynamics of Pakistan particular in one of the fastest growing industry, which is Food Industry.

RESEARCH METHODOLOGY

The total population of the study is the listed firms for food sector listed at Pakistan Stock Exchange (PSX). There are total of 22 firms listed at PSX as on 15th August 2019. Some filtering techniques were applied to obtain the study sample. First of all, firms without complete study period (i.e. listed during the entire study period) were excluded from the sample. Thus, final sample consists of 17 listed companies over the period of 2009 to 2018. Food companies are classified as Food and Personal Care Products, where total number is 22. However, our emphasis is on the food related items so we omitted companies related to personal care products. The list of the sampled companies is provided in the table-3 (appendix)

The rationale for taking 2009 as base year is that as per Companies Ordinance, 1984 sub-section (6) "every company shall keep proper books of accounts (profit and loss accounts and balance sheet) for ten years". Additionally, the rationale for taking 2009 as base year is that as the world experienced a financial crash in 2008-2009 that also impacted the Pakistani markets, and Pakistan experienced high and volatile inflation during 2009, whereas in July 2008 it increased to 24.3 percent, and then in August 2008 it reached at 25.3 percent. This was on account of a sharp spike in global commodity prices which exerted strong upward pressure on domestic prices. To some extent, it also reflected the excessive public sector borrowing as well as adjustments in public utility prices generated by losses in public sector enterprises, especially electricity, as quoted in Pakistan Economic Survey by Pakistan Bureau of Statistics (Inflation Survey, 2016), therefore data of the companies taken from 2009 to 2018.

Market Power

To calculate the impact of market power of a firm the Lerner Index (LI) (Lerner, 1934) is used in this study. This measure provides the price and marginal cost and can be calculated as follows:

$$\boldsymbol{LI = \frac{Sales - COGS - S\&A}{Sales}} \qquad \textit{(1)}$$

For our measurement we can refer it as equation 1, here Sales describes the firm's net sale, whereas COGS stand for cost of goods sold, and S&A means selling and administrative expenses. Whereas, this equation could not specifically identify the firm's particular factors that influence the market power of an industry. To overcome this issue, we can use the adjusted Lerner Index (adj-LI) that is also referred by (Datta et al., 2013) to calculate the company's specific market power. Equation is given below:

$$Adj - LI = LI_i - \omega_i LI_i$$

Here

$$\boldsymbol{\omega_i = \frac{Sales_i}{\sum_{i=1}^{N} Sales_i}} \qquad \textit{(2)}$$

Adjusted-LI equation provided above describes the LIi as Lerner Index of firm i, that can be calculated by the equation-1. As per equation-2 ωi can be described as sales proportion for firm i as compare to sum of industry sale of a particular period. N provides the number of firms in the particular industry.

Market Competition

To compute Market Competition, Herfindahl-Hirschman Index (HHI) is used by various researchers (U.S. Department of Justice, 2018; Chang et al., 2018; Yaldız, 2010). The HHI can be measured by taking a square of market share of each firm in the competition, then taking a sum of the outcomes. The HHI can vary between 1/N and 1 as given in the equation, where N is the number of the firms. It would be 1 when there is only one company in the industry that is the case of monopoly – whereas it approaches to the zero as competition escalates (Yaldız, 2010).

The standard formula for HHI can be written as:

$$\boldsymbol{HHI = \sum_{I=1}^{N} \left(\frac{X_i}{X}\right)^2} \qquad \textit{(3)}$$

Where Xi defines the sales of firm i, however X is the sum of sales of all firms in the industry. As per the various researches, HHI may be calculated by using four largest companies in the firm or taking the sum of all the companies in the industry (Cremers et al ., 2008; Chang et al., 2018).

Earnings Management

To measure earnings management for discretionary accruals, below model can be used as referred by (Kothari et al., 2005; Chang et al., 2018). Which is a cross-sectional model stated as modified (Jones, 1991) model. The formula for discretionary accruals is stated as below:

$$\boldsymbol{\frac{TA_{it}}{A_{it-1}} = \alpha_1 \frac{1}{A_{it-1}} + \alpha_2 \left[\frac{\Delta REV_{it}}{A_{it-1}} - \frac{\Delta AR_{it}}{A_{it-1}}\right] + \alpha_3 \frac{PPE_{it}}{A_{it-1}} + \alpha_4 \frac{NI_{it-1}}{A_{it-1}} + \varepsilon_{it}} \qquad \textit{(4)}$$

Among the number of discretionary accrual models, Jones model and modified jones model found best results in various testing scenarios (Dechow et al., 1995). Primary difference between jones

model and modified jones model is the later features as all the change in receivable to earnings management. In our study we started our analysis with jones model and then perform the modified jones model for discretionary accruals. In the above equation i describes as firm i, whereas t is year t, TA describes as net income minus operating cash flow. A is the total asset, whereas ΔREV is the incremental sales from year t–1 to t, and ΔAR is incremental receivables from year t-1 to t, whereas PPE is the property, plant, and equipment, and NI is described as net income. To measure discretionary accruals, we can use estimated coefficients from equation (5) as below:

$$DA_{it} = \varepsilon_{it} = \frac{TA_{it}}{A_{it-1}} - \hat{\alpha}_1 \frac{1}{A_{it-1}} + \hat{\alpha}_2 \left[\frac{\Delta REV_{it}}{A_{it-1}} - \frac{\Delta AR_{it}}{A_{it-1}}\right] + \hat{\alpha}_3 \frac{PPE_{it}}{A_{it-1}} + \hat{\alpha}_4 \frac{NI_{it-1}}{A_{it-1}} \quad \textbf{(5)}$$

In above equation, discretionary accruals are denoted by DA, whereas all the remaining variables have been defined in equation (4) above. Regardless of value of DA whether it is positive or negative, we can consider its absolute value. Absolute value of discretionary accruals is directly proportional to the earnings management by the firm, the higher the DA the higher the earnings management and vice versa.

Research Model

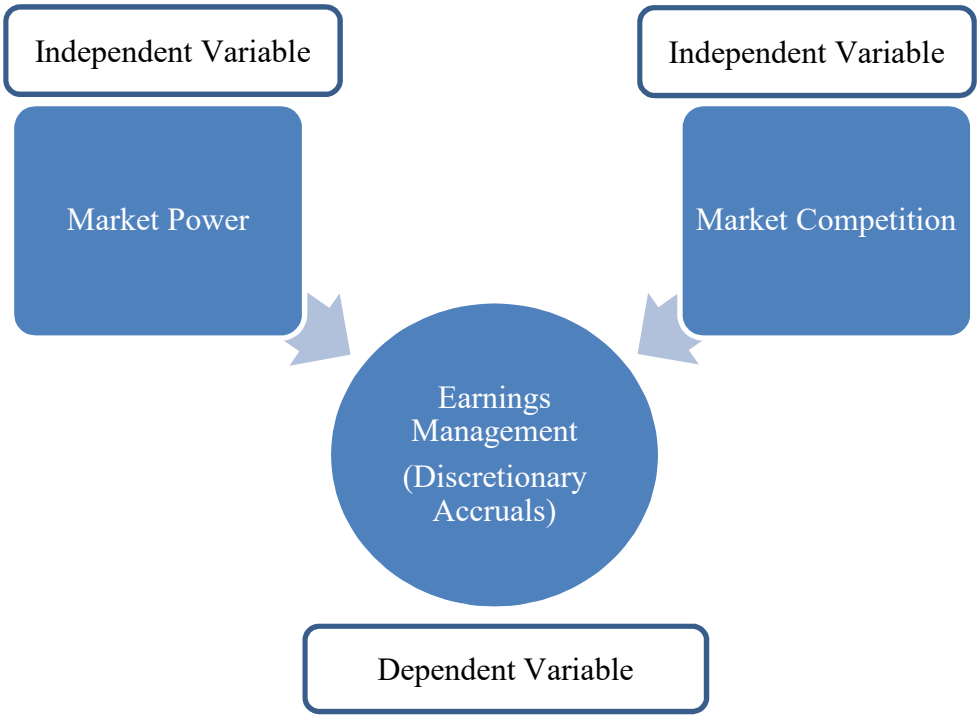

Figure 1: Research Model

Descriptive Statistics

Table 1

Descriptive Statistics of the Variables

	Observations	Mean	Std. Dev.	Maximum	Minimum
DA	103	-0.032	0.212	0.743	-0.766
ADJ_LI	103	0.124	0.266	2.205	-0.480
AGR	103	0.244	0.443	3.852	-0.232

CPI_FOOD	103	8.308	5.326	18.020	1.810
FLR	103	0.122	0.160	0.933	0.000
GDP_GR	103	4.121	1.392	5.830	1.607
HHI	103	0.005	0.014	0.073	0.000
LTD	103	14.51	15.24	16.93	0
MBV	103	12.399	31.688	248.212	-2.596
SV	103	0.593	1.563	16.171	0.092
SE	103	15.10	15.17	16.52	-12,511
SIZE	103	15.278	1.432	18.015	10.867
ABS_DA	103	0.148	0.155	0.766	0.001

Results of descriptive statistics indicate that food companies in Pakistan have an average asset growth rate (AGR) of 24.4 percent which shows that the food industry is growing with good pace and having upward curve. Moreover, financial leverage ratio (FLR) that is calculated as the ratio of long term debts to total asset, shows that industry has an average ratio of 12.2 percent that depicted the high debt load on the companies in the industry and shows that in food industry most of the companies are relying on the debt financing.

Firm size is calculated by taking log natural of firm's market value, shows mean value of 15.28. Market to book value (MBV) that can be define as the market value of a firm divided by the book value, and it is used to compare the current market value of firm to its book value of equity which has an average of 12.39. The value lower than 1 shows that the stock is undervalued or a bad investment whereas if the value is greater than 1, could mean the stock is overvalued or good investment. Our results show that the value is greater than 1 leading to good investment.

The results show that market power adjusted LI of food industry is 12.4 percent, with high deviation value 26.6 percent, whereas market competition as HHI shows value of 0.5 percent with low standard deviation of 1.4 percent. This explained that the food industry in Pakistan has greater market power while at the same time, it is experiencing less competitive environment. Furthermore, discretionary accruals (DA) as earnings management are 0.032 or 3.2 percent whereas standard deviation is 21.2 percent.

Correlation Matrix

Table 2 shows the results for correlation among the variables. It is observed that earnings management discretionary accruals (DA) has positive correlation with market power adjusted LI whereas a negative correlation with market competition HHI.

Table 2

Correlation Matrix for the Variables

	DA	**ADJ_LI**	**AGR**	**CPI_FOOD**	**FLR**	**GDP_GR**	**HHI**	**LTD**	**MBV**	**SV**	**SE**	**SIZE**	**ABS_DA**
DA	1.000												
ADJ_LI	0.14	1.000											

AGR	-0.179	-0.290	1.000										
CPI_FOOD	-0.151	-0.007	-0.053	1.000									
FLR	-0.162	-0.173	0.040	0.181	1.000								
GDP_GR	0.156	0.033	0.060	-0.867	-0.159	1.000							
HHI	-0.132	0.028	-0.090	-0.158	0.248	0.170	1.000						
LTD	-0.140	-0.034	-0.065	-0.092	0.491	0.124	0.781	1.000					
MBV	-0.239	0.059	-0.083	-0.168	-0.005	0.201	0.411	0.249	1.000				
SV	0.181	-0.001	0.141	-0.091	-0.026	0.096	-0.059	-0.058	-0.029	1.000			
SE	-0.089	0.050	-0.126	-0.266	0.178	0.303	0.421	0.561	-0.007	-0.104	1.000		
SIZE	-0.136	-0.038	-0.094	-0.287	0.053	0.343	0.539	0.652	0.206	-0.204	0.762	1.000	
ABS_DA	-0.229	0.031	0.392	0.187	0.192	-0.204	-0.054	-0.113	0.096	0.194	-0.279	-0.410	1.000

Moreover, earnings management discretionary accruals (DA) also has negative correlation with asset growth rate (AGR), CPI-Food, financial leverage (FLR), long term debt (LTD), market to book value (MBV), shareholder's equity (SE) and size of the firm. However, it is found from the results that discretionary accruals has a positive relationship with remaining two variables, that is GDP growth (GDP-GR) and sales volatility (SV).

Regression Analysis

To analyze the impact of earnings management as absolute discretionary accruals (Abs_DA) on the variables used in this study, we performed regression analysis with three effects, started with Common

Effect followed by Fixed and Random Effect models simultaneously. Below is the output for common effect model to evaluate the impact of Market Power (Adj_LI) and Market Competition (HHI);

Table 3
Regression results for Common Effects for Market Power and Competition

	Model I Common Effect (Market)		**Model II Common Effect (Competition)**	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**
C	0.8495	0.0000	0.9449	0.0000
ADJ_LI	0.0702	0.0359		
HHI			1.4384	0.0161
ASSET_GROWTH_RATE	-4.5505	0.4193	-4.7905	0.0011
MARKET_TO_BOOK_VALUE	0.0007	0.0111	0.0005	0.0004
FINANCIAL_LEVERAGE_RATIO	0.1566	0.0531	0.1031	0.3323
SIZE	-0.0463	0.0000	-0.0519	0.0000
GDP_GR	-0.0119	0.4721	-0.0122	0.5009
CPI_FOOD	0.0017	0.6976	0.0019	0.6984
Adjusted R-squared	0.2963		0.2818	
F-statistic	9.0617		8.5681	
Prob (F-statistic)	0.0000		0.0000	
Observations	135		136	

For market power and market competition common effect model is estimated. The results indicate that both models are significant whereas predictor in Market Power explains 29.6 percent variation in Abs_ DA (dependent variable) whereas in Market Competition 28.2 percent variation in Abs_DA is explained by predictor. Moreover, from the results, it is found that for Market Power MBV, FLR and Size of the firm has significant impact on the market power to influence discretionary accruals, whereas AGR, MBV and Size of firm has significant impact on market completion scenario to practice discretionary accruals.

Market Power Relationship with Discretionary Accruals

To analyze the impact of market power, we applied multivariate regression analysis to evaluate the impact of earnings management as absolute discretionary accruals with the equation;

Table 4
Regression Results for the Market Power

	Model I Fixed Effect	**Model II Random Effect**

	Coefficient	**Prob.**	**Coefficient**	**Prob.**
C	-0.2609	0.6681	0.8046	0.0000
ADJ_LI	-0.0598	0.0000	-0.0485	0.0239
ASSET_GROWTH_RATE	0.1273	0.0000	-5.8505	0.0010
MARKET_TO_BOOK_VALUE	0.0003	0.2966	0.0005	0.0006
FINANCIAL_LEVERAGE_RATIO	0.2032	0.0027	0.1865	0.0802
SIZE	-0.0729	0.0262	-0.0461	0.0001
GDP_GR	0.0058	0.7609	-0.0004	0.9864
CPI_FOOD	0.0020	0.7698	0.0032	0.6256
Adjusted R-squared	0.5031		0.1511	
F-statistic	6.8982		4.4061	
Prob (F-statistic)	0.0000		0.0002	
Observations	135		135	
Correlated Random Effects - Hausman Test				
Chi-Sq. Statistic	38.2028			
Prob.	0.0000			

For market power, two models have been estimated, that is fixed effect model and random effect model. The results indicate that both models are significant whereas predictor in model-I explains 50.3 percent variation in Abs_ DA (dependent variable) whereas in model-II 15.1 percent variation in Abs_DA is explained by predictor.

Model – I (Fixed Effect)

The results as shown in table-8 shows that earnings management discretionary accruals is significantly affected by product market pricing power (also known as market power), asset growth rate (AGR), financial leverage ratio ((FLR) and firm size assuming the 10 percent of significance level. It can be explained as with ever one unit of market power increase there is a decrease in earnings management by 0.06 units, moreover with every one percent of asset growth rate (AGR) increase, there is an increase in discretionary accruals by 12.7 percent, while keeping other factors constant. However, with every one percent of financial leverage increase in a firm, there is a surge in discretionary accruals by 20.3 percent and with one unit of size increases there is a decrease in discretionary accruals by 7.29 percent, whereas other variables has no significant impact on discretionary accruals. These results are in contrast with the results of the study done on product market pricing power and the industry concentration (Datta et al., 2013).

Model – II (Random Effect)

The outcomes depicted that earnings management discretionary accruals is significantly affected by market power (LI), financial leverage ratio ((FLR) and firm size. It can be explained as with ever one unit of market power increase there is a decrease in earnings management by 0.049 units, moreover with every one percent of financial leverage increase in a firm, there is a surge in discretionary accruals by 18.6 percent and with one unit of size increases there is a decrease in discretionary accruals by 4.6

percent, whereas other variables have no significant impact on discretionary accruals.

As far as the model selection is concerned, the value of Hausmen test shows prob. value is significant that probably rejected the null hypothesis and resulted in favor of fixed effect. The results can be interpreted that discretionary accruals are significant impact on the adjusted LI (Lerner index), moreover asset growth rate (AGR), financial leverage ratio (FLR) and size of the firm also impacts the earnings management. That means as the market power, asset growth, and financial leverage increases, it requires more earnings management whereas as the size of firm increase there is less need of earnings management. The results also show that earnings management is not significantly related with the other variables like market to book value (MBV), GDP-GR and CPI- Food. These results are inconsistent with the previous study done in China and Taiwan tourism industry (Chang et al., 2018).

Market Competition Relationship with Discretionary Accruals

To analyze the impact of market competition on earnings management, we applied multivariate regression analysis to evaluate the impact of absolute discretionary accruals by using HHI model as market concentration.

Table 5

Regression Analysis for Market Competition

	Model I Fixed Effect		**Model II Random Effect**	
	Coefficient	**Prob.**	**Coefficient**	**Prob.**
C	0.3947	0.3633	0.7603	0.0006
HHI	-0.6694	0.7576	0.3155	0.8406
ASSET_GROWTH_RATE	-0.0001	0.4070	-5.4505	0.5388
MARKET_TO_BOOK_VALUE	0.0003	0.6213	0.0005	0.3250
FINANCIAL_LEVERAGE_RATIO	0.2324	0.0173	0.1905	0.0298
SIZE	-0.0187	0.5270	-0.0437	0.0017
GDP_GR	-0.0037	0.8347	-0.0007	0.9648
CPI_FOOD	0.0035	0.3948	0.0034	0.4098
Adjusted R-squared	0.3720		0.1465	
F-statistic	4.4765		4.3114	
Prob (F-statistic)	0.0000		0.0003	
Observations	136		136	
Correlated Random Effects - Hausman Test				
Chi-Sq. Statistic	5.0180			
Prob.	0.6578			

Here again for market competition, two models are estimated, that is fixed effect model and random effect model. The outcome of the regression shows that both models are significant whereas predictor in Model-I explains 37.2 percent variation in Abs_ DA (dependent variable) whereas in model-II 14.65 percent variation in Abs_DA is explained by predictor. Total number of observations is 136 whereas further variables impact has been explained below.

Model – I (Fixed Effect)

The results as shown in Table 9 explains that there is no significant impact of market competition on the discretionary accruals, whereas earnings management discretionary accruals are significantly affected by financial leverage ratio ((FLR) assuming the 10 percent of significance level. It can be further explained as with every one percent of financial leverage ratio increase, there is an increase in discretionary accruals by 23.24 percent, while keeping other factors constant. However, other variables asset growth rate (AGR), market to book value (MBV), size of the firm, GDP growth rate (GR), CPI-foods has no significant impact on discretionary accruals. These results are inconsistent with the outcomes of another study of Tehran to find out the relationship between product market competition and earnings management (Kordestani and Mohammadi, 2016)

Model – II (Random Effect)

The results of the regression depicted that earnings management discretionary accruals are significantly affected by the market competition (assumed 10 percent of significance value) and financial leverage ratio ((FLR) and firm size. It can be explained as with every one unit of competition increases there is an increase in discretionary accruals by 0.31 units, moreover with every one percent of financial leverage increase in a firm, there is a surge in discretionary accruals by 19.05 percent and with one unit of size increases there is a decrease in discretionary accruals by 4.37 percent, while keeping other factors, whereas other variables have no significant impact on discretionary accruals as shown in the table 6 (appendix).

For the model selection the value of Hausmen test shows prob. value is insignificant that probably accepts the null hypothesis and resulted in favor of random effect. The results can be interpreted that discretionary accruals are significant impact on the Herfindahl-Hirschman Index (HHI) that shows that greater competition leads to the greater discretionary accruals, financial leverage ratio (FLR) and size of the firm also impacts the earnings management. That means as the market competition, financial leverage rate and firm size increases, it requires more earnings management whereas as asset growth rate increase there is less need of earnings management. The results also show that earnings management is not significantly impacted by the other variables like market to book value (MBV), GDP-GR and CPI- Food.

CONCLUSION

The results of present study are implication for investors who are concerned to minimize the negative aspects of earnings management and to improve the quality of financial reporting. Based on the outcome of this study can be summarized as the companies that have rapid growth in total asset of the company is more inclined towards earnings management. Similarly, the companies where financial leverage ratio is high, practices more earnings management. In contrast to this as the market value of the firm increases there is low probability for earnings management by the company's manager. Our results validate the hypothesis explained earlier in this study as under:

***H1*:** Firms with greater product market pricing power relative to other firms in the Food Industry use less discretionary accrual-based earnings management.

As shown in our results there our first hypothesis is failed to reject as there is significant negative impact of market power on discretionary accruals in other words greater market power leads to the less discretionary accruals. Hence, the firm's, where product market power is high, there is less tendency towards earnings manipulation.

***H2*:** Firms in a more competitive market in the Food Manufacturing industry use greater discretionary accrual-based earnings management.

Here, our results also failed to reject this hypothesis and it can state that there is significant positive relationship of market competition and discretionary accruals, in other words greater market competition leads to the greater discretionary accruals. Hence, we can say that the firms where market competition is high have high tendency to engage in earnings manipulation and can produce better quality financial reporting for the investors. These results are inconsistent with the study done on Tehran stock exchange (Heidarpoor and Habibipour, 2015) whereas it is consistent with the study of (Datta et al., 2013) also our results agree with the outcomes of another study of Tehran to find out the relationship between product market competition and earnings management (Kordestani and Mohammadi, 2016). Further, this study is concluded by depending on the widely accepted formula to calculate market power that is Lerner Index (LI) and for market competition Herfindahl- Hirschman Index (HHI). This study established a framework to assist the managers and investors to evaluate the practices of earnings management. This research also summarized the useful information for the investors to get the understanding on how the market power and market competition level can impact the discretionary accruals.

Limitations

Like many other studies, this study also has some limitations. Although maximum efforts have been done to capture the overall food industry but in Pakistan, there are very less number of firms are publically traded therefore their data is not publically available. Main limitation of this study is to rely on only listed company's data whereas there is a large number of companies are not listed to the Pakistan Stock Exchange in this industry. Moreover, the conclusion is derived on the basis of 10-year data based on the discretionary accruals with limited independent and control variables.

Suggestions for Future Studies

This study can be further expanded to the other sectors like banking and insurance, and some non-financial sectors where scope of investment is relatively high. Secondly other industries like automobile, pharmaceutical, textile, construction and other high tech and high growth industries can be further examined by adding more control and independent variables. This study can be done on two or more comparable countries data and can be compared the outcomes to get the insights on the behavior of earnings management of the two countries as done in the study of tourism industry of two countries China and Taiwan and comparing their results and impact (Chang et al., 2019). Here comparable means the countries where development position is alike and having similar economic position like Pakistan, India, Sri Lanka, Bangladesh, Iran and so on. Moreover, some other factors can be included in the research like capital structure of the firm, working capital, investment position, managerial incentive structure, etc. It is observed that calculation for discretionary accruals is based on the differential for two years of variables but few companies are practicing earnings management in one year whereas not performing in subsequent year that affects the outcomes of discretionary accruals. In other words, the company management apply the earnings management for one particular year as per the requirements to improve the company's performance whereas in other year such practices not implemented, therefore particularly this area can be

further investigated to extend this research.

In the last, some other calculation techniques can be introduced to calculate market power and market competition other than Lerner Index (LI) and Herfindahl- Hirschman Index (HHI) respectively. Additionally, to get the further industrial insights, a comparison can be done on the earnings management based on non-discretionary accruals verses discretionary accruals and accrual-based earnings verses real earnings management.

Recommendations

After this extensive research, it is recommended that, while making financing and investment decisions in the food industry of Pakistan, the investors must understand that where there is high competition, there are high chances of earnings manipulation in the financial statements of the firm. Investors may understand that there is high probability of earnings management where there is high competition in the industry so their financials may not reflect more transparent view. It is also recommended that investors should also recognize the need for the discretionary accruals to attract more investors and to enhance the financial requirements of the company. It is also worth mentioning that as discussed in the above literature review, this relationship may vary with industry to industry and also with the country to country as it can be influenced by the government rules and regulation that can alter the pre and post requisites for earnings management. It is also important to discuss that this study is a comprehensive overview on the discretionary accruals, but there are some non-discretionary accruals that also can influence the earnings management practices of the firm.

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APPENDIX

Table 6
Table of Variables

Variables	Symbol	Definition of Measure	References
Lerner Index	LI	A measure of Market Power in an industry. The index ranges from 0 to 1 i.e. high to low. Higher number indicates a greater market power.	(Datta et al.,2013) (Yaldız, 2010) (Chang et al., 2018)
Adjusted Lerner Index	$Adj - LI$	To assess the market power of specific factor	(Chang et al., 2018)
Omega	ω_i	It describes the sales proportion of Firm i	(Chang et al., 2018)
Sale Turnover	$Sales$	Revenue of sale of a product or service of a particular firm	(Datta et al., 2013) (Kordestani & Mohammadi, 2016) (Chang et al., 2018)
Cost of Goods Sold	$COGS$	All associated cost incurred to create a product or service sold during a period. It includes material cost, direct labor cost, and factory overheads, which is directly proportional to revenue.	(Ahmed & Azim, 2015) (Chang et al., 2018)
Selling and Administrative expense	$S\&A$	Include cost to sell and deliver the product or service and the cost to manage the company.	(Chang et al., 2018)
Herfindahl-Hirschman Index	HHI	An index used to measure the size of a firm in an industry to indicate the amount of competition between them. $HHI = \sum_{I=1}^{N} \left(\frac{X_i}{X}\right)^2$	(Datta et al., 2013) (Wasiuzzaman & Niloufar, 2015) (Chang et al., 2018) (Yaldız, 2010)
Industry Sale	X	Sum of sale of all the companies in a particular industry	(Kordestani & Mohammadi, 2016) (Chang et al., 2018)
Total Accruals	TA_{it}	It can be calculated as net income minus operating cash flow. It shows total accrual of firm i at time t.	(Mostafa, 2017) (Chang et al., 2018)

Total Asset	A_{it}	Assets are defined as anything owned by the company that has value and can be converted to cash. Here it means total asset for firm i at time t. Total Assets = Liabilities + Owner's Equity	(Mostafa, 2017) (Kordestani & Mohammadi, 2016) (Chang et al., 2018)
Incremental Revenue	ΔREV_{it}	Change in revenue of a firm i at time t.	(Akram et al., 2015) (Mostafa, 2017) (Chang et al .,2018)
Incremental Receivables	ΔAR_{it}	Change in accounts receivable of firm i at time t.	(Mostafa, 2017) (Kordestani & Mohammadi, 2016) (Chang et al., 2018)
Property, plant, and equipment	PPE_{it}	Company investment on property, plant and equipment for business use	(Akram et al., 2015) (Mostafa, 2017) (Kordestani & Mohammadi, 2016) (Chang et al., 2018)
Net Income	NI_{it}	Residual amount of profit or loss after all expenses are deducted from revenue. Net Income = Total revenue – total expense	(Chang et al., 2018)
Discretionary Accruals	DA_{it}	Non-obligatory expenses, that is yet to be realized but is recorded in the books of accounts.	(Kordestani & Mohammadi, 2016) (Akram et al.., 2015) (Chang et al., 2018)

Model -1

Common Effects –Market Power

Dependent Variable: ABS_DA

Method: Panel EGLS (Period weights)

Date: 06/16/21 Time: 13:24

Sample (adjusted): 2010 2018

Periods included: 9

Cross-sections included: 17

Total panel (unbalanced) observations: 135

Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ADJ_LI	0.070210	0.033105	2.120863	0.0359
ASSET_GROWTH_RATE	-4.55E-05	5.62E-05	-0.810344	0.4193
MARKET_TO_BOOK_VALUE	0.000720	0.000279	2.577776	0.0111
FINANCIAL_LEVERAGE_RATIO	0.156632	0.080236	1.952137	0.0531
SIZE	-0.046335	0.007527	-6.155466	0.0000

GDP_GR	-0.011925	0.016534	-0.721229	0.4721
CPI_FOOD	0.001710	0.004391	0.389437	0.6976
C	0.849514	0.144876	5.863723	0.0000

Weighted Statistics

R-squared	0.333094	Mean dependent var	0.155127
Adjusted R-squared	0.296335	S.D. dependent var	0.148662
S.E. of regression	0.129212	Sum squared resid	2.120375
F-statistic	9.061650	Durbin-Watson stat	1.544117
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.240564	Mean dependent var	0.145268
Sum squared resid	2.278963	Durbin-Watson stat	1.595048

Common Effects – Market Competition

Dependent Variable: ABS_DA
Method: Panel EGLS (Period weights)
Date: 06/16/21 Time: 13:28
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 136
Linear estimation after one-step weighting matrix
White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HHI	1.438446	0.589870	2.438583	0.0161
ASSET_GROWTH_RATE	-4.79E-05	1.43E-05	-3.349791	0.0011
MARKET_TO_BOOK_VALUE	0.000547	0.000149	3.660770	0.0004
FINANCIAL_LEVERAGE_RATIO	0.103116	0.105963	0.973133	0.3323
SIZE	-0.051928	0.011485	-4.521499	0.0000
GDP_GR	-0.012285	0.018202	-0.674925	0.5009
CPI_FOOD	0.001895	0.004879	0.388333	0.6984
C	0.944878	0.159219	5.934469	0.0000

Weighted Statistics

R-squared	0.319064	Mean dependent var	0.155857
Adjusted R-squared	0.281826	S.D. dependent var	0.147628
S.E. of regression	0.129551	Sum squared resid	2.148280
F-statistic	8.568093	Durbin-Watson stat	1.481392
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.264702	Mean dependent var	0.146211
Sum squared resid	2.218524	Durbin-Watson stat	1.516386

Fixed Effects – Market Power

Dependent Variable: ABS_DA
Method: Panel Least Squares
Date: 06/16/21 Time: 13:06
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 135
White period standard errors & covariance (d.f. corrected)
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.260920	0.606937	-0.429897	0.6681
ADJ_LI	-0.059802	0.012929	-4.625495	0.0000
ASSET_GROWTH_RATE	0.127350	0.029678	4.290989	0.0000
MARKET_TO_BOOK_VALUE	0.000289	0.000275	1.048773	0.2966
FINANCIAL_LEVERAGE_RATIO	0.203233	0.066215	3.069312	0.0027
SIZE	-0.072942	0.032362	-2.253943	0.0262
GDP_GR	0.005762	0.018889	0.305048	0.7609
CPI_FOOD	0.001955	0.006664	0.293389	0.7698

Effects Specification

Cross-Section Fixed (Dummy Variables)

R-squared	0.588369	Mean dependent var	0.145268
Adjusted R-squared	0.503076	S.D. dependent var	0.149648
S.E. of regression	0.105491	Akaike info criterion	-1.500570
Sum squared resid	1.235248	Schwarz criterion	-0.984077
Log likelihood	125.2885	Hannan-Quinn criter.	-1.290682

F-statistic	6.898222	Durbin-Watson stat	1.951071
Prob(F-statistic)	0.000000		

Random Effects – Market Power

Dependent Variable: ABS_DA
Method: Panel EGLS (Cross-section random effects)
Date: 06/16/21 Time: 13:16
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 135
Swamy and Arora estimator of component variances
White period standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ADJ_LI	-0.048475	0.021203	-2.286186	0.0239
ASSET_GROWTH_RATE	-5.85E-05	1.73E-05	-3.378549	0.0010
MARKET_TO_BOOK_VALUE	0.000542	0.000155	3.498888	0.0006
FINANCIAL_LEVERAGE_RATIO	0.186505	0.105747	1.763695	0.0802
SIZE	-0.046143	0.011786	-3.915143	0.0001
GDP_GR	-0.000400	0.023458	-0.017040	0.9864
CPI_FOOD	0.003155	0.006450	0.489146	0.6256
C	0.804580	0.168397	4.777880	0.0000

Effects Specification

	S.D.	Rho
Cross-section random	0.056712	0.2242
Idiosyncratic random	0.105491	0.7758

Weighted Statistics

R-squared	0.195402	Mean dependent var	0.078241
Adjusted R-squared	0.151054	S.D. dependent var	0.127505
S.E. of regression	0.117691	Sum squared resid	1.759104
F-statistic	4.406112	Durbin-Watson stat	1.858321
Prob(F-statistic)	0.000207		

Unweighted Statistics

R-squared	0.236087	Mean dependent var	0.145268
Sum squared resid	2.292399	Durbin-Watson stat	1.426008

Correlated Random Effects - Hausman Test

Equation: EQ02
Test cross-section random effects

Test Summary	Chi-Sq.	Chi-Sq. d.f.	Prob.

	Statistic		
Cross-section random	6.344524	1	0.0118

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ADJ_LI	-0.074327	-0.041047	0.000175	0.0118

Cross-section random effects test equation:
Dependent Variable: ABS_DA
Method: Panel Least Squares
Date: 06/15/20 Time: 10:46
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.153657	0.011629	13.21378	0.0000
ADJ_LI	-0.074327	0.041691	-1.782780	0.0772

Effects Specification			
Cross-Section Fixed (Dummy Variables)			
R-squared	0.404803	Mean dependent var	0.145268
Adjusted R-squared	0.318321	S.D. dependent var	0.149648
S.E. of regression	0.123555	Akaike info criterion	-1.220693
Sum squared resid	1.786107	Schwarz criterion	-0.833323
Log likelihood	100.3968	Hannan-Quinn criter.	-1.063277
F-statistic	4.680789	Durbin-Watson stat	1.701573
Prob(F-statistic)	0.000000		

Model 2

Fixed Effect – Market Competition

Dependent Variable: ABS_DA
Method: Panel Least Squares
Date: 06/16/21 Time: 13:25
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HHI	-0.669418	2.163827	-0.309368	0.7576
ASSET_GROWTH_RATE	-0.000104	0.000124	-0.832399	0.4070
MARKET_TO_BOOK_VALUE	0.000258	0.000521	0.495426	0.6213
FINANCIAL_LEVERAGE_RATIO	0.232429	0.096178	2.416663	0.0173
SIZE	-0.018703	0.029472	-0.634610	0.5270
GDP_GR	-0.003694	0.017664	-0.209124	0.8347
CPI_FOOD	0.003536	0.004140	0.854239	0.3948
C	0.394726	0.432404	0.912865	0.3633

Effects Specification

Cross-Section Fixed (Dummy Variables)

R-squared	0.478969	Mean dependent var	0.146211
Adjusted R-squared	0.371972	S.D. dependent var	0.149497
S.E. of regression	0.118474	Akaike info criterion	-1.269461
Sum squared resid	1.572042	Schwarz criterion	-0.755463
Log likelihood	110.3233	Hannan-Quinn criter.	-1.060585
F-statistic	4.476459	Durbin-Watson stat	2.166347
Prob(F-statistic)	0.000000		

Random Effects – Market Competition

Dependent Variable: ABS_DA
Method: Panel EGLS (Cross-section random effects)
Date: 06/16/21 Time: 13:26
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 136
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HHI	0.315467	1.565287	0.201539	0.8406
ASSET_GROWTH_RATE	-5.45E-05	8.84E-05	-0.616245	0.5388
MARKET_TO_BOOK_VALUE	0.000472	0.000478	0.988132	0.3250

FINANCIAL_LEVERAGE_RATIO	0.190467	0.086685	2.197219	0.0298
SIZE	-0.043679	0.013625	-3.205895	0.0017
GDP_GR	-0.000733	0.016558	-0.044268	0.9648
CPI_FOOD	0.003409	0.004122	0.827010	0.4098
C	0.760323	0.215482	3.528484	0.0006

Effects Specification

	S.D.	Rho
Cross-section random	0.066529	0.2397
Idiosyncratic random	0.118474	0.7603

Weighted Statistics

R-squared	0.190796	Mean dependent var	0.076845
Adjusted R-squared	0.146542	S.D. dependent var	0.127379
S.E. of regression	0.117576	Sum squared resid	1.769488
F-statistic	4.311436	Durbin-Watson stat	1.926639
Prob(F-statistic)	0.000258		

Unweighted Statistics

R-squared	0.257062	Mean dependent var	0.146211
Sum squared resid	2.241575	Durbin-Watson stat	1.520879

Correlated Random Effects - Hausman Test

Equation: EQ02

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	25.202320	2	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ADJ_LI	-0.033581	-0.045756	0.000219	0.4110
ASSET_GROWTH_RATE	0.117496	-0.000091	0.000728	0.0000

Cross-section random effects test equation:
Dependent Variable: ABS_DA
Method: Panel Least Squares
Date: 06/15/20 Time: 10:49
Sample (adjusted): 2010 2018
Periods included: 9
Cross-sections included: 17
Total panel (unbalanced) observations: 135

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.193715	0.309517	-3.856697	0.0002
ADJ_LI	-0.033581	0.039928	-0.841053	0.4020
ASSET_GROWTH_RATE	0.117496	0.026975	4.355805	0.0000

Effects Specification

Cross-Section Fixed (Dummy Variables)

R-squared	0.488469	Mean dependent var	0.145268
Adjusted R-squared	0.409093	S.D. dependent var	0.149648
S.E. of regression	0.115035	Akaike info criterion	-1.357363
Sum squared resid	1.535035	Schwarz criterion	-0.948472
Log likelihood	110.6220	Hannan-Quinn criter.	-1.191201
F-statistic	6.153898	Durbin-Watson stat	1.566586
Prob(F-statistic)	0.000000		

***Table* 7**

List of Companies Included in the Study

Company	Code	Company	Code
Al Shaheer Corporation Limited	ASCL	Punjab Oil Mill	POM
Clover Pakistan Limited	CPL	Quice Food Industries Ltd	QFIL
Engro Foods	EFL	Rafhan Maize Products Ltd	RMPL
Fauji Foods Limited	FFL	Shakarganj Limited	SGL
Ismail Industries Ltd	IIL	Shezan International Limited	SIL
Mitchell's Fruit Farms Ltd	MFFL	SS Oil Mills	SSOM
Murree Brewery Co. Ltd	MBCL	Unilever Pakistan Foods Ltd	UPFL
National Foods Ltd	NFL	Unity Foods	UF
Nestle' Pakistan	NP		