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### Impact of Acquisition on Cost Efficiency, Operational Hedging and Returns of Acquirer firms in Pakistan

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#### ABSTRACT

The current study is aimed at checking the impact of acquisition on various short run and long run firm characteristics like abnormal returns, cost efficiency and operational hedging of acquirer firms. Results have been analysed for Pakistan stock Exchange for a period of 2006 to 2019. Acquisition may signal about the future prospects of both acquirer and target firms. The event study technique indicates the significant abnormal returns after 3 days of acquisition announcement. However pre event statistics indicate abnormal returns for 5 out of 7 days before acquisition announcement. Researchers have calculated the cost efficiency scores for bidding firms three years prior to the acquisition and three years' post-acquisition. Overall results suggest an improvement in the efficiency of financial firms over time period. Non-financial sector is indicating opposite results where most of the firms are showing declining trend in efficiency after the acquisition. Next, impact of acquisition on the operational volatility is checked. The empirical results have shown a large level decrease in the operational income volatility after the takeover deal. It shows that combined firm after acquisition bring the benefit of diversification thus reducing volatility and increasing operational hedging which may ultimately reduce financial hedging. The findings of the study may help regulators as well as acquiring companies to know the potential effects of acquisition announcement.

Key words: Acquisition, Abnormal Returns, Operational Hedging, Cost Efficiency

#### 1. INTRODUCTION

With the shift of world economy into a global village, every sector of the economy was affected at large. Internationalization and deregulatory framework led the government towards more relaxed economic policies. This environment supported emergence of new competitors in many industries. Fierce competition and new market

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Received Jan 19, 2020 Accepted Sep 22,2020 Published Sep 30,2020 dynamics forced firms to either merge or to gain more power through takeover attempts. Muslumov (2002) has highlighted many advantages of takeover deals. Firms may enjoy the benefit of lower cost of productions and distributions termed as synergy due to scale economies, improvement in technology and other shared resources, control on supply chain, lower agency costs through combine ownership of assets and better management teams supervising business. Financials of the firm may also improve due to lower bankruptcy risk, tax shield creation, improved debt levels and other tax related motives. Most importantly, the takeover may replace incompetent management teams for the target firm. Another benefit of acquisition is that it provides a channel for successful implementation of innovations across the firm (Telser, 2005). So these transactions can transfer information more efficiently as compared to the other methods.

Basic theory lying at the base of mergers and acquisitions is the theory of corporate control. Bradley (1980) discussed inter-firm tender offers to acquire stocks. If management teams of any firm become flop in availing the opportunities of the market by creating the synergies and to make the performance of its resources efficient, then problems may arise. Another firm may seek the opportunity and can acquire such firm and removes the old management. So transfer of corporate control is beneficial for shareholders of both target firm as well as bidding firm (Bradely, 1983). Target firm shareholders enjoy increase in their wealth due to expectations that new management is bringing positive breakthroughs in firm. Bidding firms' value increases for its shareholders due to synergies.

Efficiency theory runs the corporate control theory. Only value increasing managers are preferred by the shareholders for their firm (Weston et al., 2004). They continue to pay premium price until target shares confer control. Efficiency theory says that acquisitions make operations of both firms efficient due to expected synergy gains. Three types of synergies may occur due to shared resources including operating synergy, financial synergy and managerial synergy (Yadong et al, 2019). Synergy in firms operations can help in realizing economies of scope and scale. Banerjee and Eckard (1998) provided a positive impact of operating synergies on gains accrued to the firms. Reduction in the cost of capital is an important benefit of financial synergies, so result is

decrease in firms' investment portfolio market risk. Financial synergies are normally achieved if both firms belong to different industries (unrelated M&A) (Singh & Montgomery, 1987). Managerial synergies can be achieved as a result of better managerial skills possessed by acquiring firm's manager so his planning and monitoring can bring improvement in performance of acquired firm.

However, Cash flow argument of Jensen (1986) argued negative role of managers in acquisition deals. They go for this transaction of corporate control change to reduce ample cash reserves of firm even at cost of shareholders wealth maximization. So instead of promoting efficiency of both firms, managers just increase their control of the firm. Jain, Kashiramka and Jain (2020) have shown the declining trend in financial and operating performance of both first time and frequent acquirers during post-acquisition time period. Thus showing that instead of synergy creation, mostly overconfidence of managerial teams or over-optimistic behaviour and agency problem dictate the acquisition deals in Indian market.

Several studies on efficiency gains of acquisitions provide mixed results. Ravenscraft and Scherer (1989) indicated positive reaction by market on acquisition announcement. Seth (1990) disproved the creation of value increasing synergies in both related and conglomerate M&A. Empire building theory describes that managers are motivated to diversify in acquisitions so that the firm size can be increased and minimum profit requirement can be meet (Marris, 1963; 1964;; Rhoades, 1983; Black, 1989). Ravenscraft and Scherer (1989) and Roll (1986) also confirmed managerial overconfidence in acquisition deals. Managerial theories (Baumol, 1959; Marris 1964, Williamson, 1969) explain this phenomenon. One short term approach to assess the success of acquisition deal is the increase in bidding firm's share price. The market efficiency level is important determinant in this regard. If market is inefficient and may over- or under-reacts to acquisition announcements and prices converge to mean values after a time lag, then capital gains are due to inefficiency of market and not due to synergy benefits. Bianconi and Tan (2019) have worked on the short and long term effects on firm by merger and acquisition announcement. Based upon large sample of 65,521 deals, their result show that acquisition announcement has a significant negative

effect on firm performance in medium run. However, there is positive long run impact on firm performance.

Literature on acquisition deals shed light on two types of studies. Ex-ante studies examine the determinant of acquisition deals. Ex-post studies weigh the effect of acquisition on the performance of the acquiring firms through comparing pre-deal vs. post-deal performance. Traditional ratio analysis is a normal way of such comparison. Most of the work is limited on the acquisition of financial sector (Resti, 1998). There is a long debate on role of acquisition in improving cost. However, empirical work is needed to apply new and sophisticated techniques (DEA, data envelopment Analysis) in determining cost acquisition of firm. Liu and Li (2014) worked on cost efficiency of Chinese internet companies and suggested that the proposed model may be extended for the international data to check the generalizability of results. There is lack of empirical research on acquisition as a tactic for operational hedging. Hankins (2009) highlighted one hidden motive of acquisition as reduction in the cash flow/earnings volatility of acquiring firm. Most of the above findings are derived from developed economies perspectives which cover acquisition mechanism in those economies (González-Torres, 2020). Less attention has been paid to the emerging and developing economies. Therefore the existing study has been based on Pakistan, one of emerging economy.

There is lack of combined empirical research on impact of acquisition in both short run and long run. The main objective of this study is to find the impact of acquisition on post-announcement period market returns, cost efficiency and operational hedging (decrease in income volatility) of bidding firm.

#### 2. LITERATURE REVIEW

#### 2.1. Acquisition Announcement and Abnormal Returns.

Most of the previous researches have been done on stock market reactions on announcement of acquisitions. Stock prices of target firms are more responsive to the acquisition activities as compared to the bidding firms in the short run. The consolidation of corporate control of firms results in a value added investment for shareholders of both firms (Dodd and Ruback, 1977). It increases shareholders wealth. Target shareholders are better off due to capital gains irrespective of the result of offer. They enjoy premium price offered in tender offer plus the increase in share price. The shareholders of target firms may not accept each and every tender offer and will select value maximizing investment offer as rational agents and reject all other offers. However, acquiring firm suffers a capital loss on purchased shares of target. Another interesting fact is that the capital gain enjoyed by acquiring firms is not due to appreciation of share price of target. The reason being that it has already paid at least expected increase in share price of target as offer price otherwise the target firm's stockholders will not tender their shares. Whole profit comes from securing control of the target resources, synergy or some other reason.

Synergistic gains from mergers and acquisitions and their partition between both firms are also discussed by Bradely, Desai & Kim, (1988). Both firms are better off by transfer of corporate control. Regulatory and other pressures on tender offers have been a zero sum game: the higher gains to the target firms investors means the equivalent losses to the acquiring firms' investors. Roll (1986) has suggested the 'Hubris Hypothesis'. He proposed that target shareholders are not benefited due to synergistic gains, rather by transfer of wealth from shareholders of bidding firms. Due to hubris, managers didn't withdraw the bid even if it is not feasible. Loss is born by the shareholders of acquiring firm because of inaccurate measurement of target firm. So some researchers blame managers for consciously leading the shareholders at a wealth loss.

Interfirm tender offers have no implicit impact on other stake holders like bondholders and creditors. This fact is proven by Kim and McConnell (1977) and Asquith and Kim (1982). Bradely, Desai, & Kim (1983) showed the increase in target firms' shareholders wealth as a result of a fruitful tender offer. These capital gains can be attributed to signalling effect about future prospects of new firm (information hypothesis) or expected synergy benefits (synergy hypothesis). So synergy hypothesis provides better explanation of capital gains as compared to information hypothesis.

Another interesting factor is that market for corporate control may act as doubleedged sword. It can foster as well as harm the pace of acquirer firms. It results in downfall of firm as managers put them at difficulty of managing a new type of business, for which they have paid premium too. On the other hand, it may lead to correction in return as well in long run. The bidding firms experience lower returns in case of diversifications, pre-acquisition poor performance and when target firm has high growth rate (Morck, Shleifer and Vishny, 1990). Similarly, another reason for negative and lower return can be low Q ratio and higher cash reserves (Lang, Stulz and Walkling, 1991). With a sample of more than 1,900 Canadian corporate acquisitions over the period 1964-83, Eckbo (1983) showed first evidence on the valuation consequences of merger activity in Canada and concludes that these investments indeed create momentous gains to stockholders of both bidder and target firms.

Shaver (2006) has given a new idea about firm value destruction as a result of acquisition through mechanism of contagion effect and capacity effect. Contagion effect is shown in case of negative shocks (competitive or environmental) of one firm being threat for another firm due to their integration and interdependence. Secondly, the combined firms can use maximum utilization of all tangible and intangible resources, resulting in slack resources. So firm may become unable to capitalize on any new opportunities offered by system. This is called as Capacity Effect. These two effects may explain the loss of value to bidding firm after acquisition deal. Li, Lu and Lo (2019) showed that target firms show better acquisition premium in short run and better performance in long run on account of decrease in information asymmetry due to analyst coverage.

Capron and Shen (2007) have related the concept of acquirer returns with ownership structure of target firm i-e, being public or private. On average, high abnormal returns are accrued to the firm as a result of acquiring private firm as compared to acquiring a public firm. This phenomenon can be termed as 'the private firm discount'. The acquirer firm can purchase private firm at a considerable discount price thus enjoying higher returns. Zaremba and Płotnicki, (2016) compared the post-acquisition performance of bidding firms in both short-run as well as long-run for European firms. The results clearly indicated that both firms are benefited in terms of value creation in short time period after take-over announcement. Even in long run, the acquisition is having no negative influence for acquirers' value after controlling for size, value and momentum effects in portfolios. Krishnamuri et al (2019) has showed that when bidding firm is also engage in CSR activities, they earn positive abnormal returns after the acquisition announcement. Such firms are taking care of shareholders by maximizing their wealth and better aligned with other stakeholders. Sabet & Heaney, (2016) checked the impact of the acquisition announcement on the share price of US listed oil and gas companies. The empirical results have provided a statistically significant market reaction as indicated through event studies. Koo,

Yamanoi and Sakano (2020) have checked the announcement of acquisition on the alliance partner of the bidding firm. The results show that such company earns negative abnormal returns. It may be due to increase in uncertain behavior of the acquirer, leading to increase in information asymmetry between acquirer firm and its alliance partner. Thus overall value of alliance decreases on account of transaction hazard and result is negative market valuation for the partner after acquisition is being announced. Another study conducted on Indian banking sector compares the performance of banks before and after acquisition through event study and ratio analysis. However, empirical results failed to show any improvement in performance of acquiring firms as a result of acquisition (Pahuja et al., 2016). Rehman, Ali & JIbran (2018) indicated that the market responded negatively towards the phenomenon of mergers and acquisition in banking sector of Pakistan. So overall, we can conclude that

H<sub>1</sub>: Acquisitions can bring abnormal returns for the acquiring firms' shareholders.

#### 2.2. Acquisition and Cost Efficiency.

A very important synergistic gain of acquisition is to improve cost efficiency. Farrell (1957) is the pioneer researcher in the field of efficiency. If a firm's actual point of production exactly lies on the benchmark frontier production function, it is the case of perfect efficiency. If it lies below the frontier, then firm (Decision Making Unit, DMU) is said to be less efficient. Two main components of efficiency include technical and allocative efficiency. Technical efficiency is defined as "ability of a firm to obtain a maximal output from a given level of inputs". Allocative efficiency, on the other hand, means "ability of a firm to use inputs in optimal proportions, given their price and production technology". (Fiorentino ,Karmann and Koetter, 2006). These two measures combine to form total efficiency. This may be named as overall cost efficiency from input perspective or overall revenue efficiency from output side.

Cost efficiency phenomenon is tested mostly in the financial sector particularly in banking sector. Researchers have applied both parametric and non-parametric tests to evaluate the bank mergers efficiency. Rhoades (1993) studied a large sample of US financial sector mergers. The results of this research could not support the improvement in cost efficiency as a result of merger. Favero and Pepi (1995) appraised the efficiency of a sample of Italian banks in 1991. They used a comprehensive technique to compute scale efficiency and technical efficiency through the data envelopment analysis (DEA) model along with traditional regression model. Rose (1996) studied 84 large U.S. bank holding companies undertaking inter-state bank mergers. Results indicated that due to mergers, the operating activities of banks diversified due to different locations thus limiting the cost of operations and chances of bankruptcy. Vennet, (1996) empirically analyzed the cost efficiency through the technique of SF (the stochastic frontier) cost function, on a sample of 492 European credit unions for 1988-92 time period. The results failed to show improvement in economies of scale but a significant cost reduction has been observed for large scale mergers. Similarly, Peristiani (1997) provided the creation of economies of scale but no efficiency after the merger of US banking sector mergers during the 1980-90 decade. Agyei-Boapeah, (2019) showed that foreign acquisition on average has a negative impact on performance of acquiring firms.

Another stream of research has analyzed the profit analysis of banking sector mergers in 1980s. The findings revealed improvement in cost and profit efficiency after mergers (Akhavein, Berger, and Humphrey, 1997). Both DEA and parametric test show similar results about the operating efficiency of acquisition deals (Resti, 1997). The difference lies just in properties of two approaches. Researchers have also highlighted that positive effect on economies of scale and scope are observed only if new branches are working in future and new setup has been established (Lang and Welzel, 1999). Lin (2005) checked the allocative and technical inefficiency along with cost inefficiency in Taiwan. Empirical results indicated that banking sector merger improves cost efficiency as well as allocative efficiency. However, the impact is positive in case of different cultures of banks. The possible reason may be the more chances of innovation in case of heterogeneous banks. Size factor also affected the efficiency and small banks outperformed large banks in this scenario. Bai et al (2019) pre-evaluated the efficiency performance of 3 schemes of acquisition and mergers by using both DEA and "potential mergers gain model" for China's railway sector over the period 2011–2015. The findings indicate that result of the merger is not always improvement in efficiency gains and better efficiency levels are achieved by geographically linked M&As.

Gudmundsson, Merkert, and Redondi, (2020) have worked on Airline industry to check whether horizontal mergers and acquisition affect the cost structure after completion of such deals. In unprofitable firms, there has been significant decline in variable cost after M&As but fixed cost has been increased. In already profitable firms, there has been no significant change in the cost structure of the firms. Another study by Stiebale and encappa (2018) has found that if acquired by firms belonging to the technologically advanced countries, the target firm will experience decrease in marginal costs and increase in profit margins. So acquisition deals results both in higher efficiencies and improved quality of the product. Cui and Leung (2020) have shown improved operating performance and stock returns for acquiring firms in long run through a sample of USA firms from 2000 to 2012. They also linked that managerial ability can affect the long run performance of bidding firm when both firms in acquisition deal belong to the same industry. Chen et al (2020) has found better performance of M&A transaction which are finance by equity rather than by debt.

Jeziorski (2014) while working on radio industry consolidations provides support for resulting cost efficiencies for the firms based upon synergy and economies of scale. The biggest gain of used estimator is its ability to identify the cost curve just from merger decisions, without even using data of cost savings. Datta, Basuil and Agarwal (2020) worked on the 250 manufacturing sector acquisition deals by USA firms between 2006 and 2013 in 33 different countries. They have documented that those companies create more shareholders value whose board of governors exhibit larg size and independent outside directors. Similarly, CEO performance may positively effect post-acquisition performance. On basis of previous studies, we may hypothesize that

**H**<sub>2</sub>: *There has been a significant change in pre-vs. Post-acquisition cost efficiency of acquiring firms.* 

#### 2.3. Acquisition & Operational Hedging

Risk management is one of the key functions of financial managers to increase value of the firm. Its importance cannot be denied in the current era characterized by cut throat competition, changing economic conditions and technological advancements. Miller & Modigliani (1958) provided this hedging decision to be irrelevant for a firm but their assumptions of perfect market are just idealistic instead of realistic. In real world, managers and accountants are actively engage in risk minimization tactics. Operational hedging can serve best in combination with financial hedging. Operational hedging refers to the reduction in risk level in firm's operations. It includes those actions that minimize risks exposures by using non-financial instruments especially the operational activities of the companies. Smith & Stultz, (1985) argued that decrease in cash flow volatility can increase value of the firm (Operational hedging theories). This smoothening of cash flows is very beneficial for shareholders. The volatility in cash flow creates problem in obtaining external funds and firm's investment policies. Thus it is costly for shareholders (Minton & Schrand, 1999). It also enhances probability of the negative cash flows in future and perceived risk of default. So firms managers strive to smooth their earnings (Truman & Titman, 1988).

Zhang, Lyles and Wu (2020) have compared post-acquisition performance based upon two different strategies i-e, exploration based vs. Exploitation based acquisition. Their results favour the better performance of Exploitation based acquisition on account of lower risk. Bauer et al (2018) have linked the acquisition performance with speed of integration between human and functional sides. Their results also show positive impact on performance in manufacturing industries.

Along with other hedging strategies, acquisition can also be a way of achieving operational hedging. It helps in reducing costly income volatility. Acquisition provides the channel of taking control of another entity with diversified business practices, assets base, technology, human skills and projects base. Berger et al., (2005) provided empirical

support for use of hedging techniques as per business structure. The acquisition of target reduces cost of income and cash flow volatility. They focus on operational hedging as its vivid changes may substitute costly financial hedging. Acquisitions are considered a tool for reduction of risk especially evident in case of conglomerate merger wave of 1960's and 1970's. In such mergers economies of scale and monopolistic gains cannot be achieved so acquirer is left with other motives like risk management. This view faces much criticism. Opponents believe that risk can be reduced by less costly diversification strategies rather than going for costly mergers and acquisitions.

H<sub>3</sub>: There has been a significant decrease in income volatility after acquisition of target firm.

#### 3. RESEARCH METHODOLOGY

This study has employed data of all the acquisitions deals finalized in Pakistani market from 2006 to 2019. Only In order to analyse 3 years post-acquisition performance of acquiring firms, the researchers have to limit acquisition deals till 2016. List of acquiring companies and detailed information have been obtained from the competition commission of Pakistan. This study considers only those acquisitions where the acquisition transaction is complete. The acquirer controls less than 50% of the target's shares prior to the acquisition announcement and owns above 51% of the target's shares after the transaction. The annual financial statement information of the acquirer has been obtained from the annual reports and balance sheet analysis published by state bank of Pakistan. Stock prices of the companies have been obtained from website of Pakistan stock exchange and business recorder. The below mention techniques has been used for these calculations.

#### 3.1. Acquisition and Stock Market Reactions.

Theory of corporate control says that acquisition announcement bring abnormal returns for both bidding firm as well as target firm due to synergy benefits. So event study methodology is used for calculating cumulative abnormal returns for the bidding firm (Bradely, 1980). The largest group of studies during 1970 to 2006 (36, or 41% of the total) used the short-term window event study method (Zollo, and Mei, 2008). The

impact of event is studied by estimating a 2 weeks window centred on each announcement of 33 acquisitions in our sample. The day of announcement is considered as 0 and the day prior to announcement is considered as -1, -2 and up to -7. Similarly, day after acquisition announcement is considered as 1, 2,..., 7. We began to cumulate CAR seven days before the announcement of the initial bid in order to capture any anticipatory price behavior (leakage of information) that may occur before the actual public announcement as per Bradley, Desai, Kim, (1988). Average Return model is used for this event study. Thus the share prices are used to calculate daily returns of all acquiring firms in the sample.

#### rate of return $(Ri) = \ln (P_t/P_0)$

 $P_t$  refers to price at time t and P0 refers to the previous price. Then the average rates of return of stock are calculated. For this purpose, researcher has taken 150 days estimation window before the event of acquisition. And average returns of each firm are computed. Then abnormal rate of return is calculated by subtracting the average return from actual return of the company.

Abnormal rate of return (AR) = rate of return (Ri) - Average rate of returnThen t-statistics is calculated by the following formula:

$$t - statistics = \frac{\text{Abnormal rate of return (AR)}}{\sigma / \sqrt{n}}$$

Sigma <sup>•</sup> refers to the standard deviation and n is the number of observation. Tstatistics tells us about the impact on rate of return due to the event. Then cumulative Abnormal rate of return CARs are calculated (the AR are added one to the next both for pre-event and post event window) to find the Impact in aggregate. The calculated values of t statistics are compared with the tabulated value i-e absolute value of t test should exceed 1.96. It means there is significant impact of that event in earning abnormal returns. This step is repeated for all acquiring firms in the sample. The Abnormal returns are averaged. So we can generalize the event by calculating Average Abnormal return (AAR) and then calculating T-statistics on the basis of this AAR. So researcher can comment on the efficiency of market.

# $t - statistics = \frac{\text{Average Abnormal rate of return (AAR)}}{\sqrt{\text{Sum of squared Standard error of estimate/n}}}$

#### 3.2. Acquisition ability and cost efficiency.

This study is based upon collected data for pre and post years of acquisition and applied DEA to calculate cost efficiency of firms respectively. Lin et al, (2010) investigated that firms with negative equity leads to financial distress, so those firms are also excluded from the sample. Input and output variables' data was extracted from financial statements to calculate the firms' cost efficiency. As this study investigates the cost efficiency of both financial and non-financial firms, there are different input and output variables for each. For calculating the cost efficiency of financial firms, the intermediation approach of Sealey and Lindley (1977) has been used. In financial sector, in line with literature three inputs are used, total deposits, number of employees and total assets. Input prices are derived for each bank as interest expense relative to total deposits, salaries expense relative to number of employees and other operating expenses for total assets. The outputs are defined as Total loans and total investments. For non-financial sector, three inputs are used, total assets, common shareholders' equity and fixed assets. Input prices are derived for each DMU as other operating expenses for total assets, profit after tax for equity and depreciation for fixed assets. The outputs are defined as operating profit and sales.

In this study researcher estimate the cost efficiency of consolidated firms by means of Data Envelopment Analysis (DEA) approach, a non-parametric approach based on convex combinations of firms. According to Charnes et al., 1994; Berger and Humphrey, 1997,). There are two main reasons due to which we have adopted DEA approach; firstly it is the easiest method to decompose cost efficiency into technical and allocative efficiency and technical efficiency into pure technical efficiency/scale efficiency components. Secondly, the Malmquist approach is known as a standard technique used over the period of time to measure the progress of productivity and efficiency, based upon DEA. To perform the analyses of the investigation, MaxDEA software has been used to calculate cost efficiency scores of sample firms. This technique was developed by Charnes, Cooper and Rhodes in 1978 to measure efficiency of the firm.

This study runs DEA on annual basis (long run) to avoid the short term behaviour of the data that leads to noise of data. The resulting efficiency score ranges from 0 to 1. 0 means company (Decision Making Unit) is inefficient and 1 means it is at maximum level of efficiency. In this research study, the researcher considers the input oriented cost efficiency with variable return to the scale. To calculate the cost efficiency, the following cost minimization DEA model is being estimated (Coelli e tal., 2005).

$$Min \sum_{i=1}^{m} Cioxio$$

St

$$\begin{array}{l} \mathrm{xio} \geq & \sum_{j=1}^{n} \mathrm{xij}\lambda \mathbf{j}, \ (\mathbf{i} = 1, \ldots, \mathbf{m}) \\ \mathrm{yro} \geq & \sum_{j=1}^{n} \mathrm{yrj}\lambda \mathbf{j}, \ (\mathbf{r} = 1, \ldots, \mathbf{s}) \\ & & \sum_{j=1}^{n} \lambda \mathbf{j} = 1 \\ & & \lambda \mathbf{j} \geq 0 \end{array}$$

Where

j =1,...,n are the number of DMUsi= 1,..., m are input quantitiesr = 1,...., s are output quantities

Cioare input prices used.

The cost efficiency of DMU unit is defined as

$$C E_0 = \frac{cox *}{2coxo}$$

So this study empirically considers whether acquisition brings any change in the cost efficiency for the acquiring firms or not.

#### 3.3. Acquisition Ability and Operational Hedging.

The current study has focused on operational hedging in the spirit of Smith and Stuqlz (1985) and Van Mieghem (2007). So current study is measuring change in firm's volatility as a result of acquisition as per Rountree et al. (2008). Operational income volatility is checked rather than cash flow volatility as income figures are better depicter of financial smoothness. Operational income volatility has been calculated for three years

pre-acquisition and 3 years post-acquisition. To bring more precision in estimates for the impact of acquisition on acquirer's income volatility, quarterly data has been used for analysis. This check of volatility before acquisition provides an idea about possible impact of acquisition deal on volatility.

## $OV Pre - Acquisition = std. deviation \{\frac{OIA}{TAA}\}$

Where OV Pre-Acquisition is the operational volatility of the pre-acquisition period, OIA is the operational income of the acquirer while TAA stands for total assets of acquirer. This is calculated for 12 quarters before year of acquisition.

## $OVPost - Acquisition = std. deviation \{\frac{OIA}{TAA}\}$

Post-acquisition Operational volatility is calculated for 12 quarters after the year of acquisition.

#### Changein

#### OpHedge = (OVpost - acquisition - OV pre - acquisition)/OVpre - acquisition

Change in operational hedging is calculated as a percentage change in the operational volatility of acquirer between two time periods. Where change in Operational Hedge is the expected percentage change in operational volatility due to the acquisition (the measure of operational hedging).

#### 3. RESULTS AND ANALYSIS

#### 4.1. Market Reactions to Acquisition Announcement

One goal of this research study has been to find whether acquirer firm shareholders enjoy abnormal returns as a result of acquiring another firm. The abnormal returns are calculated for acquiring firms and then average abnormal returns. The results are presented in the following table.

0

| Table 1. Average Abnormal Returns & Cumulative Average Abnormal Returns for |          |              |              |          |  |  |
|---|----------|--------------|--------------|----------|--|--|
| a sample of Acquirer Firms  |          |              |              |          |  |  |
| Days in Event<br>Window   | AAR      | t statistics | Significance | CAAR     |  |  |
| -7  | 0.015492 | 6.310516     | yes          | 0.015492 |  |  |
| -6  | -0.00595 | -7.94323     | yes          | 0.009544 |  |  |
| -5  | 0.000988 | 1.1095       | no           | 0.010532 |  |  |
| -4  | -0.00507 | -5.23788     | yes          | 0.005463 |  |  |
| -3  | 0.000849 | 0.756177     | no           | 0.006313 |  |  |
| -2  | 0.003167 | 4.42575      | yes          | 0.00948  |  |  |
| -1  | 0.004368 | 4.419149     | yes          | 0.013848 |  |  |
| 0   | -0.00595 | -5.19938     | yes          | 0.007895 |  |  |
| 1   | -0.00018 | -0.16202     | no           | 0.007716 |  |  |
| 2   | -0.00156 | -1.04396     | no           | 0.00616  |  |  |
| 3   | -1.4E-05 | -0.01299     | no           | 0.006146 |  |  |
| 4   | 0.00976  | 8.40846      | yes          | 0.015906 |  |  |
| 5   | 0.001381 | 1.546742     | no           | 0.017288 |  |  |
| 6   | -0.00472 | -5.3254      | yes          | 0.012566 |  |  |
| 7   | 0.005846 | 8.298112     | yes          | 0.018412 |  |  |

There is less significant impact of firms' announcement of acquiring a target firm on the value of its shares and returns. The stock earns positive abnormal return 3 days after the acquisition announcement. The t-statistics is significant as it exceeds 1.96 on 4th day of the event so there is an impact of acquisition announcement on acquirer firms' stocks. And this impact is relatively stable as it dies away in following day but become significant on 6th day again. Pre-event window indicates interesting results. Five out of seven days prior the acquisition announcement earns abnormal return. And this is important to note because pre event window might show the market reactions of the investors about acquisition based upon rumours even before proper announcement in market for. As previous studies indicate that public limited firms' bids information may be dispersed even before announcement. (Capron& Shen, 2007).

Another study also supports that the 74% of the announcement dates in formal databases are preceded by event-related signals like rumors, target search of other buyer and early stage negotiations so market reacts twice to such news as compared to formal

dates of announcement (Arslan & simsir (2016). In Indian and Chinese sample firms, international acquisition announcement has resulted in favorable response by the shareholders as they earn 0.71% and 0.23% average abnormal return on event day in emerging economies (Jain, Kashiramka and Jain, 2019). The results of event window favors hypothesis 1 that acquisitions can bring abnormal returns for the acquiring firms' shareholders. Average Abnormal Returns of the acquirer firms are graphically depicted in the figure 1. It shows that acquisition announcement get the positive response from the stock market three days after the returns. The slow response of market for such acquisition deals may be due to the information dissemination about public targets may take place before the announcement. The graph also shows pre-announcement downwards shift in the acquirer returns. It may be the result of insider trading.



#### Figure 4.1. Average Abnormal Returns of Acquiring firms

The AAR is negative on the day of acquisition announcement. However, 39% of the sample firms show positive abnormal return on the day of acquisition announcement. A positive effect on returns is observed on the preceding days before announcement of acquisition. It indicates the market knowledge about acquisition prior to announcement date given by competition commission of Pakistan. Cumulative Average Abnormal Returns of the acquirer firms are graphically depicted in the figure 2. After acquisition announcement firstly the CAARs are showing downward trend indicating decrease in AAR. However it starts upward trend from 3 post-announcement days onwards. The CAAR increases to 0.25 per cent from day -7 through day 7.



Figure 4.2. Cumulative Average Abnormal Returns of Acquiring firms

The less significant results may be interpreted as there is mixed results in the existing research. The acquirer firms may enjoy synergy and its shareholders may enjoy abnormal gains (Dodd and Rabwck, 1977). Sometimes, it had already paid the premium price for the company and the shareholders do not enjoy gains on acquisition announcement (Bradely M., Desai A., Kim E. (1988). These results also indicate the efficiency level of the financial markets. These results show that normally less abnormal returns are being enjoyed in Pakistani market of corporate control so it may indicate the market is comparatively efficient so that's why less chances to earn abnormal gains for the investors.

#### 4.2. Acquisition and Cost Efficiency

This research study has been conducted to determine changes in the firms' cost efficiency level for a period of 7 years. It includes 3 pre-acquisition, year of acquisition

and 3 post-acquisition years. The researcher has calculated cost efficiency scores (DEA technique) for a sample of acquiring firms for both sectors and table 2 indicates the average results.

| Table 4.2. Cost Efficiency Scores for Acquiring Firms |   |                     |  |  |  |
|---|---|---------------------|--|--|--|
| years of  | Cost efficiency Scores for Acquiring<br>firms |                     |  |  |  |
| acquisitions  | <b>Financial firms</b>                        | Non-financial firms |  |  |  |
| -3  | 0.908611                                      | 0.682314            |  |  |  |
| -2  | 0.934238                                      | 0.659361            |  |  |  |
| -1  | 0.925783                                      | 0.743405            |  |  |  |
| 0   | 0.964882                                      | 0.743405            |  |  |  |
| 1   | 0.975502                                      | 0.662808            |  |  |  |
| 2   | 0.91068                                       | 0.730998            |  |  |  |
| 3   | 0.973471                                      | 0.602651            |  |  |  |

Overall, the financial sector is more efficient as compare to the sample of nonfinancial firms. The financial sector is almost above 90 percent efficient in all years as compared to 60-70% efficiency in case of non-financial firms. The reason may be more stringent requirements of disclosures and reporting for such banks. So it keeps a check on their efficiency. The graph (Figure 3) indicates the comparison between cost efficiency of two sectors.



Figure 4.3. Cost Efficiency Scores (overall sample)

However, as per this study objective, there has been less significant improvement in cost efficiency due to the acquisition. For financial firms, a bit improvement has been observed right after the year of acquisition. However, the firms become less efficient in 2nd post-acquisition years although it regains it in next year. The reason may be that acquisition is not bringing cost advantage to the production process of the firm.



Figure 4.4. Cost Efficiency Scores (Financial Sector)

Mixed results have been observed in case of non-financial firms. And no obvious trend has been observed which may suggest improvement of cost efficiency of firm as a result of acquisition. It rather indicates the decline in efficiency in the first year after the acquisition. Firms' efficiency decreases from 74% to 66 % i-e, it is almost 10 % decrease in efficiency.



Figure 4.5. Cost Efficiency Scores (Non-Financial Sector)

The major conclusion lies that after acquisition, there have been less significant improvement in the bidding firm cost efficiency for the sample firms in case of Pakistani market for corporate control. In the current study, the common deviation in cost efficiency scores may be the outcome of some important characteristics of financial system in that time period. This sector is specially admired for remaining even strong during the financial crises 2008-09, and this feature had increased amount of FDI. The results shown in the Table 3 indicates the distribution of firms in various levels of efficiency.

| Table 4.3. The Overall Efficiency of the bidder Companies (Non-financial Sector) |                           |         |         |            |            |            |      |
|--|---------------------------|---------|---------|------------|------------|------------|------|
| Year   | The overall<br>efficiency | 0.0-0.2 | 0.2-0.4 | 0.4<br>0.6 | 0.6<br>0.8 | 0.8<br>0.9 | 0.91 |
| t-3  | Sample Number             | 0       | 5       | 1          | 0          | 1          | 7    |
|  | <b>Proportion</b> (%)     | 0%      | 36%     | 7%         | 0%         | 7%         | 50%  |
| t-2  | Sample Number             | 1       | 3       | 3          | 1          | 0          | 6    |
|  | <b>Proportion</b> (%)     | 7%      | 21%     | 21%        | 7%         | 0%         | 43%  |
| t-1  | Sample Number             | 1       | 3       | 0          | 2          | 0          | 8    |
|  | <b>Proportion</b> (%)     | 7%      | 21%     | 0%         | 14%        | 0%         | 57%  |
| t  | Sample Number             | 1       | 3       | 0          | 2          | 0          | 8    |
|  | <b>Proportion</b> (%)     | 7%      | 21%     | 0%         | 14%        | 0%         | 57%  |
| t+1  | Sample Number             | 0       | 3       | 4          | 1          | 1          | 5    |
|  | <b>Proportion</b> (%)     | 0%      | 21%     | 29%        | 7%         | 7%         | 36%  |
| t+2  | Sample Number             | 0       | 2       | 3          | 2          | 1          | 6    |
|  | <b>Proportion</b> (%)     | 0%      | 14%     | 21%        | 14%        | 7%         | 43%  |
| t+3  | Sample Number             | 0       | 4       | 5          | 1          | 0          | 4    |
|  | <b>Proportion</b> (%)     | 0%      | 29%     | 36%        | 7%         | 0%         | 29%  |

It is evident that almost half of the firms were quite efficient in the years prior to the acquisition. For example, 7 out of 14 firms were 90-100 % efficient in the third year prior to the acquisition. While 57 % of the firms lie in maximum level of efficiency in year of acquisition which suddenly dropped to the 36% in the first year after acquisition. After acquisition, most of the firms are lying n the area of 40-60% efficiency. This fall in cost efficiency scores indicate the failure of synergies in terms of reduction in cost. These firms may have achieved short term effects in stock market reaction to acquisition announcement but such deals have not brought long term efficiency gains particularly for non-financial firms. These results are consistent with the previous studies. On average, very little improvement (5 % or less) in cost efficiency has been observed by most of the studies Berger andHumphrey, 1992;Rhoades, 1993; and Peristiani, 1997, Hanelt, 2020). Possible benefits from consolidation of two enterprises may not be actualized due to managers' ineffectiveness or integration problems. So results are mixed in nature.

| Table 4.4. The Overall Efficiency of the bidder Companies (financial sector) |  |    |     |     |     |  |  |  |
|--|--|----|-----|-----|-----|--|--|--|
| The Overall Efficiency of the bidder Companies                               |  |    |     |     |     |  |  |  |
| Year   | The overall efficiency 0.40.6 0.60.8 0.80.9 0.91 |    |     |     |     |  |  |  |
| t-3  | Sample Number                                    | 0  | 3   | 1   | 6   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 30% | 10% | 60% |  |  |  |
| t-2  | Sample Number                                    | 0  | 1   | 3   | 6   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 10% | 30% | 60% |  |  |  |
| t-1  | Sample Number                                    | 0  | 2   | 1   | 7   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 20% | 10% | 70% |  |  |  |
| t  | Sample Number                                    | 0  | 1   | 2   | 7   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 10% | 20% | 70% |  |  |  |
| t+1  | Sample Number                                    | 0  | 0   | 1   | 9   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 0%  | 10% | 90% |  |  |  |
| t+2  | Sample Number                                    | 0  | 2   | 1   | 7   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 20% | 10% | 70% |  |  |  |
| t+3  | Sample Number                                    | 0  | 0   | 1   | 9   |  |  |  |
|  | <b>Proportion</b> (%)                            | 0% | 0%  | 10% | 90% |  |  |  |

Above results also indicate that on average banks are 92.57% cost efficient before acquisition implying that the banks can produce 7.71% more output at same level of cost. However, in the post-acquisition time period, the average bank shows an improvement of 3.82% in cost efficiency. There can be numerous reasons for this improvement with respect to cost efficiency. Already banks are almost near maximum level of efficiency by making full utilization of resources so less chances of enhancement in efficiency. Another reason may be the motive behind acquisition was not to achieve economies of scale or scope; rather it was regulation based intent of the bank. These interesting academic results for banking sector are not surprising due to historical regulation in Pakistan. Geographic and other restrictions have constrained competition in banking over decades so inefficiencies were present in addition to this, nonbanks are not

allowed to acquire banks so market for corporate control for banks was limited. But now both restrictions have been removed so fierce competition and threat of takeover has made this sector an efficient one. Relatively detailed reporting requirements have also made banking industry quite vigilant about maintaining firm efficient. The above analysis is in favour of hypothesis 2 that cost efficiency of firm before acquisition change after the acquisition decision.

#### 4.3. Acquisition and Operational Volatility

The researchers have used 12 quarters data for the acquirer firm for both preacquisition as well as post-acquisition time periods. The OI/TA ratio has been calculated for all the quarters. Due to the unavailability of the quarterly data for the most of the firms in our sample, results have been presented for only few firms. Then operational volatility is calculated by taking standard deviation of OI/TA ratio. Operational volatility figures are depicted for both time periods. Change in operational hedging shows the impact of acquisition on income volatility of the acquirer firm. If this change in operational hedging is negative, it depicts the decrease in operational income to assets ratio for the acquiring firm after the acquisition. Thus the acquisition has been successful in reducing operational income volatility. Lower volatility refers to operational hedging benefits related to lower costs of convex taxation, potential financial losses or external capital. Following results have been obtained as presented in the table 5.

| Table 4.5. Operational Hedging due to Acquisition |  |             |             |            |  |  |  |
|---|--|-------------|-------------|------------|--|--|--|
| Operational Volatility                            |  |             |             |            |  |  |  |
|   | Pre-Post-Acquiring firmsAcquisitionAcquisition |             |             |            |  |  |  |
| 1   | Lucky Cement Ltd.                              | 0.013251454 | 0.011102841 | -0.1621417 |  |  |  |
| 2   | United Bank Limited                            | 0.016083637 | 0.000583557 | -0.9637173 |  |  |  |
| 3   | Pakistan Petroleum Limited                     | 0.270414528 | 0.013914959 | -0.9485421 |  |  |  |
| 4   | M/s. IGI Insurance Limited.                    | 0.037527605 | 0.020061156 | -0.4654294 |  |  |  |
| 5   | JS Bank Limited                                | 0.010008595 | 0.002381778 | -0.7620267 |  |  |  |
| 6   | Summit Bank Ltd.                               | 0.014183903 | 0.004910651 | -0.653787  |  |  |  |
| 7   | Fauji Fertilizer Company Ltd.                  | 0.012977039 | 0.024667431 | 0.90085207 |  |  |  |

| 8  | Byco Petroleum Limited       | 0.0807696   | 0.02723173  | -0.6628468 |
|----|------------------------------|-------------|-------------|------------|
| 9  | Bank Islami Pakistan Limited | 0.003063839 | 0.000875773 | -0.7141582 |
| 10 | Summit Bank Limited          | 0.008803761 | 0.010805594 | 0.22738386 |
| 11 | M/s. Habib Bank Limited.     | 0.002546742 | 0.000571993 | -0.7754019 |
|    | Average                      | 0.0426937   | 0.010646133 | -0.7506393 |

The table indicates that on average the acquiring firms have 4.27% operational volatility before the takeover deal which reduces to 1.06% after the deal showing a 75% fall in the volatility. Thus firms on average achieve the operational hedging through the transfer of ownership in acquisition transaction. The reasons may be due to mix of resources, knowledge, manufacturing processes, services and expertise level in the firm as a result of acquisition. United bank limited is showing the maximum results of change in operational volatility as depicted by 96% reduction. Similarly, Pakistan Petroleum limited, JS bank limited, Bank Islami Pakistan limited and Habib bank limited are among those firms showing high percentage reduction in operational volatility. IGI Insurance Limited, Summit Bank Ltd., and Byco Petroleum Limited are those firms where change in operational volatility lies between 40-70%. Lucky Cement Ltd. Shows 16% reduction in operational volatility as a result of the acquisition.

Few firms are showing no improvement in volatility implying that acquisition is not bringing operational hedging for these firms. Fauji Fertilizer Company Ltd. Is showing 90% increase in operational volatility after the acquisition deal. The results are in line with the Hankins (2009) who also showed acquisition can bring the benefit of operational hedging. These results prove our hypothesis 3 by showing decrease in income volatility.

#### 5. DISCUSSION

This study has focused on checking the short term effect of acquisition on the acquirer firms' returns as well as long term effects on cost efficiency and operational hedging. The even study technique indicates the significant abnormal returns after 3 days of acquisition announcement. Dandapani, Hibbert and Lawrence (2020) also showed that

shareholders earn 1% three-days cumulative abnormal returns in international mergers & acquisitions. However pre event statistics indicate abnormal returns before acquisition announcement. These results may be interpreted as showing market reactions prior to formal announcement due to rumours about acquisition. These results may also indicate the efficiency level of market so no chance to earn abnormal returns for the investors. So results are in line with theory of corporate control. Results are in line with a recent study by Ahmed et al (2020) who show that acquiring firms earn positive abnormal returns significantly. They have linked performance of bidding firm with bidding firm and market characteristics. Wonder and Lending (2019) also showed increase in shareholders base after acquisition announcement through event study technique.

Overall cost efficiency results suggest an improvement in the efficiency of financial firms over time period. However, this sector is quite efficient even before acquisition and is improving even after taking control of another firm. Acquisition of target may reduce cost of banks due to shared processes and technological advancements. The average bank shows an improvement of 3.82% in cost efficiency after taking over another firm. Too high efficiency in pre-acquisition period may leave fewer chances for improvement in efficiency. Al-Sharkas et al (2008) worked on cost efficiency for merged banks and the results were almost similar. Acquisition of another firm brings market power for the firm which may result in increased prices by exploiting customers. Or it may pass benefit of synergy to customers by charging lower prices. Non-financial sector is indicating opposite results results favour efficiency theory.

The study has analysed quarterly information to calculate operational volatility. The percentage change in operational volatility is accounted for as operational hedging. This proxy of operational hedging is quite innovative as being based on theory rather than less precise categorical proxies like diversification and flexibility. The empirical results show a large level decrease in the operational income volatility after the takeover deal. The acquisition of the target reduces volatility significantly in the majority of the acquisitions. It shows that combined firm after acquisition bring the benefit of diversification thus reducing volatility and increasing operational hedging which may ultimately reduce financial hedging. This study is not focusing only on acquirer returns at the announcement period but is also showing long term performance comparison of acquirer firms with respect to cost efficiency and changes in operational hedging through operational income volatility. Comparison of long term vs. short term performance is a key contribution of the current study.

#### 6. CONCLUSION

The study have checked both short and long term effects of the acquisition on the performance of the acquiring firm. It has been concluded that acquiring firms' enjoy abnormal returns after the announcement of the acquisition deal. It may be due to the potential synergy gains in such deals. Secondly, three years post vs. three years pre acquisition cost efficiency has been compared and there has been significant improvement in cost efficiency after acquisition in financial sector. Non-financial sector could not improve cost efficiency as a result of such takeover deals. Similarly, operational volatility has been improved in most of the bidding firms as a result of transfer of corporate control.

The current research has many implications for the managers of both firms. Managers should keep the information about the acquisition deal very secret before its formal announcement and should evaluate the target very carefully. Managers should be clear about information asymmetry when choosing a deal. Otherwise their returns would suffer as a result of acquisition deal. The results of acquisition should not be increase in burden of the firm rather than the improvement in efficiency and synergy. The study also provides insight about market efficiency level through abnormal returns earned by investors. A negligible increase in cost efficiency in post-acquisition in financial sector of Pakistan has been observed. Regulators, policy makers and antitrust authorities should keep in mind these factors for approving any acquisition in financial sector. The results are contradicting for non-financial firms so their dynamics are quite different from highly regulated financial sector. Those acquisition applications should not be approved which increases the market share and give more monopoly power to market leaders as this power may exploit customers by charging high prices. The improvement in operational hedging provides insights for risk management.

These empirical results are not free of limitations. Haleblian et al. (2009) has argued the limitations of using short term event study methodology particularly in emerging economies. As this may evaluate the value of the decision at cost of idea implementation. So long term measure will be better to be used. (Peng & Beamish, 2014). Sample size is very limited in Pakistani capital market as compared to previous studies in developing countries. So it may reduce the generalizability of the results. The findings may be replicated with larger sample data and alternative techniques to check the external validity of our results. Many firms have been dropped out of sample as they were private and no data is available for such firms. Most of the previous studies have been conducted in developed economies where markets are assumed to be informational efficient. Such markets are characterized by the capital being channelled to the most profitable projects and assorted information spreading idiosyncratic risk. However, the current study has been conducted in Pakistani capital market, one of emerging economy characterized by relatively inefficient markets. So our arguments should be revised in scenario of a developed financial market scenario.

The current study may advocate various future directions for the investors. The future studies may use variance of acquirer returns within the sample and relate it with various firm specific factors and management features. Future research could also check post-acquisition management across targets to comprehend the role of target ownership on integration efforts and outcomes due to changes in culture and governance mechanism of both acquired firm and acquiring firm.

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