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Stock Price Synchronicity and Voluntary Disclosures: Evidence from Pakistan

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Abstract

In this paper, we investigate the relationship between stock price synchronicity and voluntary disclosure in perspective of Pakistan. The degree of co-movement of stock price depends on the relative amount of firm-level and the wide market information. The aim of this study is to investigate the relationship between the degrees of firm's information which is measured by voluntary disclosure levels and how much this firm-specific information is incorporated in the stock price, measured by synchronicity. We use 5-year data from Pakistan Stock Exchange for the period of 2010 to 2014 for KSE 100 index. We use SD-SCORE to measure the level of voluntary disclosure. SD-SCORE is calculated based on the information provided in firm's annual reports. We assign points to each company based on five broad criteria. Additional points were given if firm provides quantitative data of some specific item used in the calculation of SD-SCORE. Further, R^2 is used as a proxy of synchronicity which shows the level of information impounded into share prices. We regress synchronicity on voluntary disclosure level to find out whether it incorporates in share price or not. We conclude that in Pakistan, voluntary disclosure has a significant positive relation with stock price synchronicity. Our results suggest that not only public but also the private information incorporate in the stock price and provide inversely U-shape relationship between synchronicity and voluntary disclosure. The results of this study are based on multi-variant analysis, there is a significant positive relation between stock price synchronicity and firm's voluntary disclosure levels.

Keywords: Agency Theory; Asymmetric Information; Pakistan Stock Exchange; Synchronicity; Voluntary Disclosure

Introduction

Synchronicity in the perspective of the finance and accounting is used in the capital market and called stock price synchronicity. Stock price synchronicity can be described as the individual stock price upward or downward movement with relative to some conditions. (Roll, 1988) explains that degree of co-movement of stock price depends on the relative amount of firm-level and the wide market information. It can be explained that stock return synchronicity is the variation of common returns for each firm to their total return variation of the whole capital market. While (Chung et al., 2011) says that the situation of stock synchronicity when the price of all single firms is highly correlated to the movement of the stock price

(Roll, 1988) finds that stock price synchronicity is explained by the Capital Asset Pricing Model. (Morck et al., 2000) says synchronicity as a dependent variable, can be used as the measure of the degree of firm-specific information into share price and is computed by R-square. This R-square can be estimated by CAPM. He argued that by using CAPM, stock price co-movement might

be downward when disclosure specific information of firm is better which should be reflected by the low value of R square. (Perold, 2004) finds that the firm's return is affected by both factors which are non-diversifiable and the firm's specific characteristics. Asset price model provides the fundamental and uses as the benchmark to understand the agency of cause between asset price and the behavior of investment according to the degree of market, industry and the firm-specific information.

(Meek et al. 1995) find voluntary disclosures are that information which is beyond the requirement of GAAP and SECP rules, according to rules the information which is provided in firm's annual report must be relevant to the user for decision making. (Hossain et al., 2014) find mostly firms disclose the reason(s) for an auditor can change in limited conditions, it means there is flexibility to disclose the information and auditor use the methods which have fulfilled the mandate of SECP. (Alford et al., 1993, Ball et al., 2000) find information disclosure is some time depends on firm's policies. Different firms are carried out voluntary but it can vary from firm to firm or industry, company size and geographic region.(Diamond & Verrechia, 1991) find a high level of disclosure can increase the liquidity of firm's stock. He argues voluntary disclosure is affected by the structure of corporate governance and the structure of the ownership. Voluntary disclosure has the significant influenced by the firm's top executives and that have their own style to disclose of firm-specific information which is based on their personal backgrounds like their career and experiences.

(Fama & Laffers, 1971) proposed information hypothesis which says that the firm's specific information is compulsory in the annual reports of the firm, that specific information is important for the investor to minimize their risk on investment, taking right decisions on their investment and earn more profits. It is compulsory that this useful information includes all type of information which can be firm-level, market level and industry level. In the benefits of the voluntary disclosure, we take it from the different perspective. On the investor side, it provides the full information to the investor and reduces the asymmetric information between aware and unaware investors; otherwise, it will take the market to inefficient and not reflect the exact prices (Bushman & Smith, 2001). On the firm side, voluntary disclosure reduces the uncertainty regarding firm's goals and targets, and it gives the right option to choose the best, managers to take good decisions according to the situation and communication smoothly between the managers and other related interested parties like stakeholder who are directly connected to the firm. (Glosten et al. 1985, Diamond et al. 1991) find that a higher level of disclosure increases the liquidity of the market and lowers the cost of capital.

Stock price synchronicity reflects the resource allocation in the capital market. The aim of this study is to investigate the relationship of voluntary disclosure and how this information is impounded into stock prices. Pakistan Stock Exchange (Formerly KSE) is an emerging market and this study has implications for both regulators and investors. This study proposes the how an investor can formulate trading strategies based on information disclosure. Further, the motive of the voluntary disclosure of firm is when they need or plan to issue equity or public debt or want to acquire another company; the firms disclose their firm-specific information to investor and effect their perception (Healy et al., 2001). (Aboody & Kaznik, 2000) propose another motive of manager to voluntary disclosure is to take favorable effect of their stock returns about their stock related compensation. Mostly analyst uses the voluntary disclosure of the firm-specific information to use the forecast. Managers disclose good or bad information to fulfill their stock returns requirements. (Barry& Brown, 1985) explain voluntary disclosure plays a significant role to solve that problem because information is spread equally on every side and it helps to reduce the capital cost. (Skinner, 1994) finds voluntary disclosure is also used to save the litigation cost; it is the responsibility of the manager to reduce the cost of litigation to pre-disclose the bad news.

Literature Review

Stock price synchronicity is the measurement which is used in share price movement, and it can also reflect the level of firm-specific information within the industry and market levels (Roll, 1988). In very simple words stock return synchronicity is common return variation for each firm to the variation of the whole capital market (Roll, 1988). He explains the stock price synchronicity by Capital Asset Pricing model (CAPM). CAPM was first discussed by (William Sharp, 1964) in research papers. In 1976 Black extended the model and argue that firms return affected by both factors which are firm-specific characteristics and non-diversifiable factors. This extended model makes a fundamental contribution to explaining the asset price. In synchronicity, when the co-movement is high, there are also some other variables affected which are not used in our paper, like it increases the liquidity and same as the high volatility of the stocks also increase the liquidity of the stock (Chan, Hameed, & Kang, 2013). He explains two hypotheses, under the hypothesis of relative synchronicity, there is a positive relation between the stock return co-movement and the liquidity.

Voluntary disclosure is that information when the firm can disclose with any cost through annual reports. The main reason to disclosure the information is to reduce the asymmetric information because due to asymmetric information, agency problem will rise**.** It happens in that situation where the owner and controller of the company are in a different firm. Principal pays to the agent for their services to take the decisions on its behalf of them (Jeasen & Meckiling, 1976). Sometimes the reason for this conflict of interest is to invest money in other projects while the principal does want so (Smith & Skinner, 1999). The other main reason for this problem to hide the information from the principal. It is always supposed that managers or agents have more information as compare to the investor (Healy & Palepu, 2001). Managers sometimes hide the adverse information from the stakeholder, or in other situation when information give benefits they disclose more information (Milgrom, 1981). Voluntary disclosure plays an important role to reduce asymmetric information. There are some forces which affect the manager's decisions to take the voluntary disclosure; one of them is to reduce the capital cost (Barry & Brown, 1985).

(Roll, 1988) makes the thing clearer the degree to which stock moves together. He argues that stock price synchronicity depends on the comparative amount of market-wide or firm–specific information contributes to the stock prices. (Morck, 2000) argues that the economies of higher per capita GDP move comparatively unsynchronized manner, vice-versa the economies of lower per capita GDP stock price move up and down together. That's why we can define synchronicity as the co-movement in particular time of stocks of share market.(Shiller, 1981, west 1988) find that the stock price level is too high to explain by the volatility in the implicit fundamentals like dividends. (West, 1988) provide the theoretical framework where the increase in the firm-specific return volatility is related with less firm-specific information and more noise in return. The previous studies represented stock price synchronicity can be defined by R-squared from assets pricing regressions which can be used to measure the relevant firm-specific information reflected in returns. (Morck et al., 2000) find that the stock price in poor countries which have less market equity, weak protection of investors rights, weak legal framework and so many factors which move together to make a weak market, has high synchronicity.

(Kalok C et al., 2013) provides the evidence of higher return co-movement means the higher systematic volatility relative to the total volatility which improves the synchronicity. S&P 500 index shows the high synchronicity of that stock which improves the liquidity and there is a positive relation between the stock return synchronicity and the liquidity. They provide the empirical support

that the higher stocks return synchronicities represent the higher information environment and it provides the asymmetric information between the outside investor and firms insider. (Iftekhar H. et al., 2014) find in the case of China that the better development of the legal and political institution are the result of the great firm-specific information. When stock price shows the more firm-specific information, there will be the less stock price synchronicity. Improved property rights and better law enforcement and high political pluralism are all associated to the stock price informativeness. The corporation must disclose their information through the financial reports, management discussion and analysis and other regulatory mediums. (Ferdinand A. Gul et al., 2010) suggest that different factors like concentrated ownership, audit quality of firm's disclosure, government ownership or foreign ownership also affect the share price of the firm's stock They also find the synchronicity is higher when the mostly shareholder is the government. And synchronicity inversely effects on the foreign ownership and auditor quality.

Methodology

The latest research finds the relation between stock price synchronicity and the voluntary disclosure of firm-specific information. According to previous literature, stock price synchronicity can be measured by an R-squared method which impounds the firm-specific information into stock price. R-squared is estimated from CAPM which is derived from many previous research studies (Roll, 1988; Morck et al, 2000)

The main interesting question is that: Whether the firm's voluntary disclosures is related with price synchronicity?

Voluntary disclosure model uses the self-constructed variable SD-SCORE which is constructed by (Jiang and Habib, 2009), this variable measure only the quantity of data but not the quality of firm-specific information. Our result shows the significant and positive relation between the stock price synchronicity and firm's voluntary disclosure, It means that in firms stock reflects both information, not only the firm-specific but private information also (Xing & Anderson, 2011). We suggest that our results are monotonic mean it has either positive or negative relation between R-squared or quality of disclosure. (Kelly, 2005 & Dasgupta et al., 2010) also shows that the significantly positive relationship between voluntary disclosure and synchronicity, so it suggests tacitly that R-squared can use as a direct proxy for quality of information. While in contrast (Morck, 2000, Jin and Myers, 2006) find in their studies that there is a significantly negative relationship between voluntary disclosure and stock price synchronicity. (Haggard et al., 2008) also suggest that R-squared can use as an inverse proxy for quality of information. Both studies which support our results and not suggest the same R-squared proxy of quality of information but both are not agreed and have a different set of mind to use this proxy. Some other studies suggest that there is no-monotonic relation means neither significantly positive or nor negative relationship between stock price synchronicity and voluntary disclosure. Ashbaugh et al., 2006) proposed in his study that R-squared can't use as the universal proxy for the quality of disclosure.

We use the Karachi Stock Exchange 100 index. Overall Pakistan stock market is small but with high trading activities. In many aspects, this stock market appears to be working as a typical emerging market with high volatility, high returns, high market concentration and catch the investments, Pakistan's markets is segmented from the major markets provide a potential venue for diversification. (J. Iqbal, 2008). We take data from the KSE 100 index where are the largest top buying and selling 100 companies of Pakistan, the fiscal year 2010 to 2014. We discuss all trading firms in KSE 100 except the firms belonging to financial firms, real estate, and trust sectors because of their different financial structure. The main reason for using non-financial firms are only that in non-financial, high leverage indicates distress while it is normal in other financial firms (Fama,

1992). The main purpose of the study is to find out what extent effect disclosure levels of the firm are incorporated in stock price.

The main variable of interest is SD-SCORE which divide in differ grading of voluntary disclosure as described in Appendix.1 which is provided (Jiang and Habib, 2009). To calculate other variables, financial data of firms is used such as total assets, profit, total liabilities, the book value of equality which is collected from the annual reports. Total 62 companies are including in study because, in KSE 100, we eliminate financial sectors and some other firms due to an insufficient amount of data.

We estimate the firm-specific return to measure the synchronicity using the linear regression. Which is firstly developed by (Morck et al., 2000).We calculate the R-square of each firm for each calendar year through the regression of normally daily return ($RTRN_{i,t}$) on market-wide return ($MKT_{i,t}$). Here we don't use the industry index because in Pakistan industry does not as much matter as a market index. overall for each financial year of one firm, we calculate the R-squared using the following regression model:

$$RTRN_{i,t} = a + \beta_1 MKT_{i,t} + \beta_2 MKT_{i,t-1} + \varepsilon_{it}, \textbf{(1)}$$

Market return for a specific day t is measured by the product of each firm market return and weighted percentage value. Therefore the MKT_i is the value-weighted of these firms daily return. $MKT_{i,\,t-1}$ is lag return matrix which the presence of the information effect on the price of the share. We use the market index which is same for all the companies.

Following (Piotrowski and Roulstone, 2004). We take log transform R-square from first regression. This study uses R^2 measure to determine synchronicity. The reason for ignoring classical measure is that it only captures country or market level synchronicity while fail to capture firm level synchronicity (Matthew, 2015).

$$SYNCH = log(R\ SQUATED/(1\text{-}R\ SQUARED)_{I,t}, \textbf{(2)}$$

The model includes other six common control variables, these are 1. The market value of equity MVE, 2. SIZE, 3. Leverage LEV, 4. Market to book ratio MB, These variables are used in different papers by Piotroski & Roulstone, 2004: Gul et al, 2010)

$$SYNCH_{i,t} = a_0 + \beta_1 SDSORE_{i,t} + \beta_2\, log(MVE_{i,t}) + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 MB_{i,t} + \varepsilon_{i,t,}, \textbf{(3)}$$

Here the first control variable is the market value of equity is a proxy of log(MVE). It's measured by logarithm market value of the firm. This variable shows the market capitalization of a firm that points out the cost for an investor to buy the firm outright. The second control variable is the size of the firm. The proxy of SIZE is to take the log of total assets of a firm. Different studies conclude that size of the firm effect to explain the stock returns (Kim, 2003). The third control variable is leverage risk, which proxy of LEV is total liabilities divided by total assets. It helps the firms to find risk factors and can improve the firm profit. The fourth controlling variable is a market to book value ratio. The proxy of MB is using total firms market value to divided the book value of its equity. It helps the firm to make a quick comparison of other compotators of compare their share price is it undervalued or overvalued.

In this paper, all that four control variables are associated with firm stock price return. These control variables are an important part of the stock price synchronicity measurement and it also the component to our main interest variable SD-SCORE.

Empirical results

This table 1 reports descriptive statistics for all variables. Our main variables are synchronicity and D-SCORE. It is a yearly based observation of synchronicity. There is a dependent variable from synchronicity SYNC. The total number of observation is 310. The main interest of

variable in this study is D-Score, the mean is 33.29, it shows that the voluntary disclosure is not as higher in our country firms. The mean of leverage is 0.526716 which shows the presence of high leveraged firm in our sample. The size of firms which are used is almost same in size. The mean of size is 7.256.

Table 1: Descriptive Statistics

	SYNC	SD-SCORE	LEV	MB	MVE	SIZE
Mean	1.07121	33.29032	0.526716	38.40498	10.09676	7.256108
Median	0.88168	35	0.490041	1.135414	10.11039	7.346025
Maximum	0.31507	45	7.738727	2812.430	12.05067	8.889862
Minimum	-5.2680	11	0.013933	-110.621	7.789584	4.491502
Std. Dev.	0.86934	6.514577	0.508873	290.5259	0.691467	0.66881
Observations	310	310	310	310	310	310

Note: The table reports descriptive statistics of the entire variables, either dependent or independents

Table 2 reports the correlation of all the variables. It shows the positive relationship between the synchronicity and voluntary disclosure. There is no high correlation of independent variables so there is no problem of high correlate.

Table 2: Correlation Analysis

	SD-SCORE	LEV	MB	MVE	SIZE	SYNC
SD-SCORE	1					
LEV	-0.06123	1				
MB	0.101694	-0.09067	1			
MVE	0.410734	-0.03823	0.134469	1		
SIZE	0.150483	0.006972	-0.51409	0.525339	1	
SYNC	0.26405	0.025758	0.055082	0.414463	0.412636	1

Note: This table states the correlation of all the variable, and SYNC is the dependent variable

Table 3 reports the synchronicity regression results of this paper. According to result, there is a significant and positive relation between the stock price synchronicity and voluntary disclosure. The coefficient of SD-SCORE is 1.87 and it is significant which shows a strong positive relationship between firm's disclosure level and how disclosure level effects the price synchronicity. The other control variable like SIZE has also highly significant relation with synchronicity, it shows the large size firm has higher synchronicity risk. LEV and MVE do not affect synchronicity as shown by an insignificant relationship with synchronicity.

Table 3: Regression Analysis

SYNH			
Variables	**Coefficient**	**t-statics**	**P-value**
Intercept	-7.283266	-11.39388	0.0000
SD-SCORE	1.875303***	2.641706	0.0087
LEV	0.103702	1.249486	0.2124
MB	.000948***	4.667320	0.0000
MVE	0.044164	0.484387	0.6285
SIZE	0.696078***	6.779410	0.0000
*** significant at .01 level ** significant at .05 level *significant at .10 level			

Note: This table reports the relation between synchronicity and other independent variables. The synchronicity is calculated using equation SYNCH=log (R SQUATED/(1-R SQUARED), R is calculated by market return.

The results of this paper are consistent with previous research. (Xing & Anderson, 2011) argued on the positive relation of synchronicity with firm-specific information. According to their research, stock price synchronicity not only incorporates the public information but it also incorporates the private information also. He described the inverse U-shaped relation between synchronicity and firm-specific information.

Empirical evidence also highlights the degree of disclosure. It distinguishes between the quality of public and private information impound in the stock price. In different conditions of stock price synchronicity are high or low, are based on the information environment of more or less public information of firm (Kelly, 2005).

Conclusion

This study is conducted to examine the relationship between stock price synchronicity and voluntary disclosure in Pakistan stock exchange from 2010 to 2014, to measure voluntary score, SD-SCORE is used. The synchronicity is measured by R-squared. The results of this study are based on multi-variant analysis, there is a significant positive relation between stock price synchronicity and firm's voluntary disclosure levels. (Xing & Anderson, 2011) research paper supports our results also. The amount of voluntary disclosure or firm-specific information also incorporates in the share price of the firm's stock, but it is not proportionate always in stock because firms stock price reflects both information either public or private and voluntary disclosure is only the public information. (Xing & Anderson, 2011) describe this relation as an inversely u-shaped between stock price synchronicity and firm-specific information.

The result of our study is to highlight the difference between public and private information incorporate in stock price. Stock price synchronicity can be either high or low due to the different informational environment of more or less firm specific information. The ambiguity in our results also clears by (Kelly 2005, Dasgupta, 2010). They show in their papers that quality of information is positively related with stock price synchronicity.

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Appendix 1

Main Element of SD-SCORE

1. **Background information**:

Statement of objectives or corporation goals;
Organizational structure is described
Statement of corporate strategy given;
Principal market;
Principal product;
Competitive environment;
And what strategies are used to achieved their goals during the year
Note: to give one point to all and plus one additional point when quantitative data.

2. **Five years of historical results summary:**

Information about return on asset or return on assets (tax rate, interest expense, net income and total asset)
Information about net profit margin or net profit margin (tax rate, net income, sales and interest expense)
Information about Assets turnover or assets turnover (sales and total assets)

Information about return on equity or return on equity (net income and stocks holder equity)
Summary of sales and net income for most recent eight quarters and comparison of financial performance with the prospectus.
Note: for each item, one point score and 2 scores are for more the ten years' information.

3. **Key non-financial elements**:
Numbers of employees;
Units sold
Market share
Unit selling price
Production volume
Percentage of sales in production in last five years
Customer satisfaction
Growth in units sold
Regulation compliance
Note: for each item two-point score.
4. **Project information:**
Cash flow forecast;
Research and development expenditure forecast
Profit forecast
Cash flow forecast
Share price estimation; and
Share price forecast
Note: for each prediction 2 points score and for point estimate three points score
5. **Management discussion and analysis:**
Change in inventory;
Change in income;
Change in revenue;
Change in cost of goods sold;
Change in operating income;
Change in selling and administrative expense before income tax, depreciation, and amortization
Change in net income
Change in inventory
Change in net accounts receivable
Change in market share
Change in capital expenditure
Change in interest expense or interest income
Note: for detailed of each item one point score and one for additional point if explanation with quantitative data