

The Relationship between Disclosure of Corporate Social Responsibility Information and Stock Synchronicity: Evidence from Listed Liquor Companies

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Abstract—This paper discussed the relationship between listed liquor companies' stock synchronicity and the disclosure and its quality of corporate's social responsibility information. The study showed that investors would not take the disclosure of corporate's social responsibility information into consideration when making investment decisions. While with the improvement of the disclosure quality of corporate's social responsibility information, investors would take social responsibility information as an important source of information. And corporate social responsibility about customer was key social responsibility information that investors concern about. Shareholders' and employees' responsibility and environmental responsibility could reduce stock synchronicity, but were insignificant.

Keywords—stock synchronicity; corporate social responsibility; information disclosure; listed liquor companies

I. INTRODUCTION

Active disclosure of corporates' social responsibility information can show the governance level of listed companies, and the information is an important access on processing external social environment. So active disclosure of social responsibility information can increase the transparency of the company and lay influence on investment behavior. With the development of Social Responsibility Investment, scholars pay more attention to answer the question about whether voluntary disclosure of social responsibility information can become special information or not, and if voluntary disclosure could eliminate information asymmetry, thus to affect investors' trade behavior. Foreign scholars focused on the relationship between social responsibility information disclosure and the capital market reaction (Ingram, 1978; Galema et. Al., 2008); social responsibility information and stock liquidity (Amihud and Mendelson, 1986; Diamond and Verrecchia, 1991), and so on. In recent years, Chinese scholars pay attention to the relationship between the social responsibility information and stock returns, disclosure of social responsibility information

and stock returns (Jiang et al., 2011); social responsibility information and investors' trading action (Li and Xiao, 2012); social responsibility and Stock liquidity (Zhu and Yao, 2010) and so on. But the conclusions of those studies were different. The reasons were the following: firstly, it was difficult to exclude the influence of profit and industry policy in the study of corporate stock market reaction. Secondly, the large sample research may cover special industrial stakeholder because of mismatch of industrial stakeholder in the calculation of social responsibility. Therefore, it is more proper to do corporate social responsibility research in a single industry (Wood and Jones, 1995).

In fact, since the 2008 financial crisis, Chinese listed liquor companies have received heated extolling by both institutional investors and medium and small investors, so they have shown up unique market trends. However, stock price of listed liquor companies has limited down for a time after the policy of the prohibition of Three Public Consumption and the event of chemical residues. The drastic market volatility leads us to ponder on what kind of stakeholders' information is key information to stock market fluctuation, and if investors take the voluntary disclosure of corporates' social responsibility as an important reference when making investment decisions or not. Firstly, we measured the synchronicity indicators of the Chinese listed alcoholic companies, by using the yield rate of the 29 listed liquor companies from 2004 to 2012; then we discussed the relationship between the listed liquor companies' stock synchronicity and the disclosure and its quality of corporates' social responsibility information. The study found that disclosure of corporate social responsibility is significantly related with stock synchronicity, which means that investors would not consider corporate social responsibility information disclosure when they made decision in the present Chinese stock market. But with the improvement of the quality of corporates' voluntary disclosure of social responsibility information, investors would consider the social responsibility information as important reference information when making

investment decisions. And investors would pay special attention to corporates' social responsibility about customers. The shareholder responsibility, environmental responsibility, employees responsibility could reduce the stock synchronicity, but were insignificant. It is worth to mention that investors of liquor listed companies do not pay much attention on social responsibility such as share of information between partners and fair trade.

II. LITERATURE REVIEW AND HYPOTHESIS

The earliest study about the relationship between the corporate social responsibility and the capital market value were done by Morskowitz (1972) and Vance (1972), using the unadjusted market return. According to the founding of Cochran and Wood, unadjusted market return would inevitably bring different conclusions on the study of the relationship between corporate social responsibility and stock return of companies. In the follow-up studies, many scholars argue that there was no significant difference on stock returns between companies with good corporate social responsibility performance and companies with poor social responsibility performance (Galema et. Al., 2008). And Brammer (2006), Becchetti and Ciciretti (2009) even found that the average market returns of companies with good social responsibility performance were significantly below their poor performance peers. Those different conclusions of various studies have shown that it was difficult to exclude the influence of profit of companies in the study of the relationship between corporate social responsibility and the value of companies in the stock market, so we have to take the efficient market hypothesis into account, when we study the relationship between the social responsibility and the stock market return (Aupperle, et al., 1985). In other word, the stock price can respond to the information timely and fully. Using the event study, Ingram (1978) found that companies which voluntarily reveal their social responsibility information and with good quality perform better than their peers who did not reveal their social responsibility information or who reveals but with poor quality. However, Lindblom (1994) also argued that the true purpose of enterprises which actively disclose their social responsibility report is to deflect the attention of investors on their other poor social performance. Thus, investors can not obtain accurate and comprehensive information about social responsibility from the voluntary disclosure report, and make accurate judgment based on the report because of the heterogeneity of social responsibility information (Gamble et. Al., 1995). Guo and Zeng (2013) found that Chinese listed liquor companies had poor disclosure of social responsibility information, but there were significant improvement in 2006 and 2008 because of related law issue. So we proposed Hypothesis1:

The disclosure of social responsibility information of Chinese listed liquor companies is significantly related to stock synchronicity.

Investors make decision based on external market information and heterogeneous information. (Biondi and Giannoccolo, 2009). The poorer the disclosure quality of information is, the higher level of information asymmetry between interiors and exteriors becomes. In this case, stock

price was easily to be manipulated by insiders and it would vibrate vigorously. Only companies with good social responsibility performance may voluntarily reveal their social responsibility information with high quality in order to distinguish themselves from their peers with poor social responsibility performance. Jiang et al (2011) found that if companies voluntarily disclose their social responsibility information with poor quality and without key performance information, investors would take such kind of disclosure as hypocritical behavior. On the contrary, if investors take the disclosure of the social responsibility report as genuine, the higher social reputation goes with the better quality of social responsibility information. Moreover, it would yield better market reaction. Thus, we proposed Hypothesis 2:

The better the quality of social responsibility report is, the lower companies' stock synchronicity becomes.

Investors make a different investment decision based on different types of capital market information. Zhu et. al., (2010) recognized that two kinds of social responsibility information respectively about staff and government that companies have disclosed were significantly and positively correlated to corporate value; In opposite, corporate investors responsibility was negatively related with the corporate value; meanwhile, supplier responsibility and enterprise value relations are not significantly related. We can conclude that investors have differently sensitivity to different kinds of responsibility information, and make different investment decision accordingly. We proposed Hypothesis 3:

Different social responsibility information has different impact on investors' behavior, and has shown different stock synchronicity.

III. RESEARCH DESIGN

A. Samples

By the end of 2012, there were 46 listed alcoholic companies in China. After eliminating companies from our samples which were listed abroad, once delisted, as well as shareholding listed alcoholic companies, and alcohol sales companies, we only have 29 sample listed companies. Financial data showing companies special characteristics and trading data of stock market were from CSMAR database. The annual reports and social responsibility reports (or sustainable development report) of the 29 samples from 2004-2012, came from the website of Shanghai stock exchange and Shenzhen stock exchange. By manual collecting and sorting related information, we used the content analysis method to measure the 243 samples of corporate social responsibility index.

B. Variable Description

1) The Measurement of Corporate Social Responsibility Performance

We get 40 specific indicators and a total of 120 points, based on the study of Guo and Zeng (2013). According to the evaluation method of Guo and He (2016), we hold all kinds of corporate social responsibility index of Chinese listed liquor companies, that is SDI_j and the total social responsibility CSR_index . The specific calculation formulas are formula (1) and formula (2):

$$SDI_j = \frac{\sum_{i=1}^n x_{ij}}{3n}, i = 1, 2 \dots n \quad (1)$$

$$CSR_index = \frac{\sum_{j=1}^k \sum_{i=1}^n x_{ij}}{\sum_{j=1}^k 3n}, i = 1, 2 \dots n, j = 1, 2 \dots k, k = 7 \quad (2)$$

In formula (2), CSR_index means the total social responsibility, and SDI_j means the j th kinds of corporate social responsibility index, x_{ij} means the j th kinds, the i th indicator's grade.

2) The Measurement of Synchronicity

In many years, scholars have been using synchronicity to measure the stock market efficiency, the aim of which shows whether heterogeneity of company information can be fully reflected in the stock market (Xiao et. al., 2011). If there was synchronicity, it means that firms' specific information was less influenced on the capital asset pricing. In other words, the phenomenon had destroyed companies' signal transfer mechanism, and weakened resource allocation efficiency of capital market by price (Wurgler, 2000; Morck et. al., 2000). Roll (1988) found that fitting coefficient r^2 in the capital asset pricing model (CAPM) was related to firms' specific information. Morck et.al. (2000) firstly took r^2 as the measurement index of stock synchronicity. In his opinion, r^2 reflect firms' specific information. The smaller r^2 is, the more specific information the stock price conveys. Thus according to

Morck, et. al (2000), we measure stock synchronicity using fitting coefficient r^2 in asset pricing model. The measure model is formula (3):

$$r_{it} = a_i + \beta_i r_{mt} + e_{it} \quad (3)$$

In formula (3), r_{it} r_{mt} mean the rate of share return and the rate of market return respectively at the t th trading day. And we use Shenzhen and Shanghai complex profit index to express the market return. r^2 indicates the proportion of explanation of how the changes of individual stocks price can influence the market index. The greater r^2 , the greater stock price affected by the market, and the lower heterogeneity information reflected, so the stock synchronicity is higher. While, Durnev et al. (2003) recognized that the scope of r^2 did not conform to the normal distribution, so we need to do logarithmic transformation, before doing regression analysis. We defined synchronicity as $SYNCH$, like formula (4):

$$SYNCH = \log \left(\frac{R_i^2}{1 - R_i^2} \right) \quad (4)$$

3) Control Variable

Based on previous findings, we study the relationship between the corporate social responsibility information of listed liquor companies and the stock synchronicity. We controlled firm size, book-to-market value, Tobin's Q, net assets returns ratio (ROE), earning ratio per share (EPS) and so on as our predecessors have done. Specific variable names are shown in table 1

TABLE I. VARIABLE INFORMATION TABLE

Variable	Means	Measures
SYNCH	synchronicity	According to Morck et.al(2000)and Durnev et. al.,(2003)
independent variable		
CSR_index	The index of corporate social responsibility	According to Guo and Zeng(2013) , Guo and He(2016)
CSR_dis	Social responsibility report	Dummy variable,yes means 1,versa is 0
SDI_j	All kinds of social responsibility index	several aspects, like enterprise, community, environment, government, consumers and partners
Controlling variable		
SIZE	Firm size	The logarithm of the total assets
ROE	net assets returns ratio	Net profit/stockholder's equity
BM	book-to-market	stockholder's equity /market value
EPS	net assets returns ratio	net assets / tradable share
Tobin's Q	Tobin's Q	(average stock price*total stock+ liabilities)/ the total assets

C. Models And The Research Methods

In order to study the relationship between the social responsibility report and stock synchronicity, we constructed the following regression model:

$$SYNCH_{it} = \alpha + \beta \times CSR_dis_{it} + \lambda control_{it} + \varepsilon_{it}$$

model (1)

Based on Model (1), in order to further verify the relationship between

corporate social responsibility report quality and stock synchronicity, we build regression model 2:

$$SYNCH_{it} = \alpha + \beta_1 CSR_index_{it} + \beta_2 (CSR_index_{it} \times csr_dis_{it}) + \lambda control_{it} + \varepsilon_{it} \quad \text{model(2)}$$

We want to further test what kind of social responsibility information that investors are more sensitive to in the companies who voluntary disclose their social responsibility information, So we build regression model 3 based on Model 2:

model3

$$SYNCH_{it} = \alpha + \beta_1 SDI_{jt} + \lambda control_{it} + \varepsilon_{it} \quad \text{if } CSR_dis = 1$$

In models (1-3), the $SYNCH_{it}$ means synchronicity of the i th listed liquor companies in t th year; CSR_dis_{it} means the i th

listed liquor companies whether reveal the social responsibility report in t th year or not; CSR_index means the social responsibility index of the alcohol companies; SDI_{jit} means the

j th kind of social responsibility index of the i th listed liquor companies in the t th year. The control means control variables, such as $SIZE$, ROE , EPS and $Tobin's Q$.

IV. EMPIRICAL RESEARCH

A. Descriptive Statistical Analysis

TABLE II. DESCRIPTIVE STATISTICAL ANALYSIS

Variable	Number	Average	Median	Minimum	Maximum
<i>SYNCH</i>	243	-0.900	-0.840	-5.190	1.050
R^2	243	0.310	0.300	0.0100	0.740
<i>CSR_index</i>	243	0.280	0.210	0.0700	0.760
<i>CSR_dis</i>	243	0.170	0	0	1
<i>EPS</i>	243	0.590	0.230	-1.890	12.82
<i>Tobin's Q</i>	243	2.520	1.940	0.580	9.510
<i>BM</i>	243	0.590	0.520	0.110	1.710
<i>ROE</i>	243	0.0900	0.0800	-1.380	0.450
<i>size</i>	243	21.53	21.36	19.38	24.54

In table 2, the average R^2 of the listed liquor companies is 0.310, lower than the average R^2 of Chinese stock market measured by Gul et.al (2012).while, the average *SYNCH* is -0.900 after logarithm transfer, lower than -0.232 which was

measured by Gul et.al (2012). The average of *CSR_index* is 0.28, which means the initiative revelation of corporate social responsibility information is low, and the disclosure quality of social responsibility information is not high.

B. Correlation Coefficient Analysis

TABLE III. VARIABLE CORRELATION COEFFICIENT ANALYSIS

	<i>SYNCH</i>	<i>CSR_index</i>	<i>CSR_dis</i>	<i>EPS</i>	<i>Tobin's Q</i>	<i>BM</i>	<i>ROE</i>	<i>SIZE</i>
<i>SYNCH</i>	1							
<i>CSR_index</i>	0.200***	1						
<i>CSR_dis</i>	0.103	0.581***	1					
<i>EPS</i>	-0.156**	0.306***	0.187***	1				
<i>Tobin's Q</i>	-0.151**	0.169***	0.115*	0.388***	1			
<i>BM</i>	0.155**	-0.265***	-0.180***	-0.333***	-0.824***	1		
<i>ROE</i>	-0.0790	0.355***	0.188***	0.562***	0.312***	-0.333***	1	
<i>SIZE</i>	-0.0420	0.566***	0.284***	0.597***	0.141**	-0.0950	0.471***	1

According to the table3, we found that *CSR_index* was significantly and positively correlated to *SYNCH*. It infers that revealing of social responsibility information by companies may not effectively improve the heterogeneous information, and to change the investor behavior. We further suppose that there is interaction effect between whether revealing the social responsibility report or not and synchronicity. In the table 3, we found *EPS* and *Tobin's Q* were significantly negative to synchronicity respectively. We concluded that *EPS* and *Tobin's Q* were heterogeneity information. These information would become investment decision-making reference and reduce stock synchronicity.

responsibility report or not would not become firms' special information. When the companies voluntarily reveal the social responsibility report, the interaction, $CSR_index \times CSR_dis$, is -0.357 and also significantly at the 5% level. It suggests that better quality of social responsibility report could eliminate information asymmetry between internal and external, and the higher quality of social responsibility information become the important reference information. So, the synchronicity becomes low. The results of the model (1) and model (2) support the Hypothesis 1 and Hypothesis 2, respectively.

TABLE IV. SOCIAL RESPONSIBILITY AND THE SYNCHRONICITY

	Model 1	Model 2
	<i>SYNCH</i>	<i>SYNCH</i>
<i>CSR_dis</i>	0.287*** (3.22)	1.985*** (6.02)
$CSR_index \times CSR_dis=1$		-0.357** (-2.06)
<i>EPS</i>	-0.112*** (-4.80)	-0.0754*** (-5.51)
<i>Tobin's Q</i>	-0.015 (-0.37)	0.013 (0.32)
<i>BM</i>	0.257 (1.12)	0.534** (2.25)
<i>ROE</i>	0.188 (0.76)	0.043 (0.15)
<i>SIZE</i>	0.01 (0.25)	-0.123*** (-2.92)
_cons	-1.206 (-1.37)	0.940 (1.09)
N	238	238
R_sq	0.069	0.134

Notes: z values are in brackets, ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

C. Regression Analysis

1) The Relationship between Social Responsibility Information and Stock Synchronicity

Using the model (1) and model (2), we test the relationship between voluntary reveal of social responsibility report and its quality and stock synchronicity. Because the sample of the listed liquor companies is an unbalanced panel, we use the POOL_OLS regression analysis considering the heteroscedasticity of section and cross section to avoid the effect from industry policy. We use the stata13.0 to regress the models, and the regression results were shown on table 4.

In the table4, column2, it was the regression result of model (1). The result of the model (2) was shown on column 3. The coefficients of *CSR_dis* was 0.287, and significantly positive at the 1% level. It suggests whether reveal the social

2) The Relationship Between The Kind of Social Responsibility Information Validation and Stock Synchronicity

We use the model (3) to test the relationship between the kind of social responsibility information validation and stock synchronicity in the sample of companies which voluntarily reveal the social responsibility in their report. The result of model (3) was shown on table5. *SDIT_gov*, *SDIT_cust*, *SDIT_bus*, *SDIT_share*, *SDIT_emp*, *SDIT_com*, *SDIT_env* mean government responsibility information, consumer liability information, business partners, investors, responsibility, information, employee responsibilities, donations and community responsibility, environmental responsibility, respectively. According to the table5, the

coefficient of *SDIT_cust* is significantly negative -1.217, at the 5% level. It means that investors will consider the consumer responsibility information as the heterogeneity information, with the better disclosure level of consumer responsibility information, so the customer information can reduce the stock synchronicity. While, the government, environment, investors, employees, environment responsibility information were insignificantly negative related to the stock synchronicity. Surprisingly, only the coefficient of the business partners' information is insignificantly negative. Maybe investors do not care about this information. It is sure that the coefficients of the *EPS* are always significantly negative at the 1% level. So the *EPS* is still the most important information. We can say that the *EPS* is the basic information on making invest decision.

TABLE V. THE RELATIONSHIP BETWEEN THE KIND OF SOCIAL RESPONSIBILITY INFORMATION VALIDATION AND STOCK SYNCHRONICITY

	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
<i>SDIT_gov</i>	-0.552 (-0.796)						
<i>SDIT_cust</i>		-1.217** (-2.973)					
<i>SDIT_bus</i>			0.458 (0.903)				
<i>SDIT_share</i>				-0.237 (-0.797)			
<i>SDIT_emp</i>					-0.431 (-0.580)		
<i>SDIT_com</i>						-0.359 (-0.619)	
<i>SDIT_env</i>							-0.154 (-0.139)
<i>EPS</i>	-0.302*** (-3.339)	-0.421*** (-4.195)	-0.281*** (-3.071)	-0.303*** (-4.912)	-0.312** (-2.919)	-0.317*** (-3.280)	-0.306** (-2.478)
<i>Tobin's Q</i>	0.01 (0.135)	0.008 (0.126)	0.06 (0.822)	0.041 (0.445)	0.016 (0.255)	0.017 (0.209)	0.034 (0.455)
<i>BM</i>	0.573** (2.305)	0.622*** (3.733)	0.811*** (3.388)	0.658 (1.613)	0.574*** (3.083)	0.567* (1.996)	0.637** (2.767)
<i>ROE</i>	0.533 (0.87)	1.344** (2.78)	0.445 (0.683)	0.503 (0.959)	0.472 (0.809)	0.592 (0.916)	0.417 (0.778)
<i>SIZE</i>	0.161 (1.205)	0.264** (2.368)	0.056 (0.883)	0.125*** (7.075)	0.147 (1.035)	0.14 (1.188)	0.11 (0.548)
<i>_cons</i>	-4.009 (-1.547)	-5.953** (-2.616)	-2.472* (-1.934)	-3.466*** (-5.986)	-3.776 (-1.406)	-3.726 (-1.579)	-3.215 (-0.859)
<i>N</i>	41	41	41	41	41	41	41
<i>R-sq</i>	0.348	0.454	0.345	0.331	0.337	0.334	0.329

Notes: z values are in brackets, ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

V. CONCLUSION

We measured the synchronicity and the corporate social responsibility index of the Chinese listed liquor companies, which is a special, controversial industry from 2004 to 2012. We discuss the relationship between corporate social responsibility report reveals, as well as its quality and the synchronicity. We found that the social responsibility is not an important reference when investors make their investment decisions. While with the improvement of the voluntarily reveal of social responsibility report, investors will consider social responsibility information as an important source of reference. Investors often focus on the customer information, and this information is statistically significant. However the shareholder responsibility, environmental responsibility, employees responsibility can reduce the stock synchronicity, but statistically insignificant. Surprisingly investors do not care about the information of business partners. Moreover, *EPS* is still the most important heterogeneous information that liquor stock investors concern about.

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