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計畫主持人：梁嘉紋

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Stock Price Reactions to Competitors' Earnings Announcements

ABSTRACT

A company's earnings convey information about industry-wide trends and firm-specific conditions. Prior studies mainly focus on how information about *industry-wide* news contained in one firm's earnings is transferred to related firms and capitalized in their security prices. However, examining average information transfers by taking the industry as a whole masks the potential information transfers that arise from market structure distinctions among firms. Thus, it is unclear whether one firm's earnings news conveys *different* information about its competitors' expected earnings. This issue is of interest because reported earnings reveal the realized outcome of the strategies adopted by a firm and how earnings announcement of one firm may provide favorable or unfavorable signals about its competitors' future cash flows is not well understood in the literature. This study investigates this issue by hypothesizing that information transfers among firms within the same industry are associated with the types of strategic competition among firms. Specifically, this study hypothesizes that, if firms compete as strategic substitutes, the non-announcing firms will have a positive (negative) price reaction to announcing firm's negative (positive) earnings surprise and that, if firms compete as strategic complements, the non-announcing firms will have a negative (positive) price reaction to announcing firm's negative (positive) earnings surprise. Overall, the evidence from our sample of S&P 500 firms is consistent with prior information transfer literature that industry-wide news contained in one firm's earnings is transferred to competing firms. However, we do not find evidence that firm-specific information is transferred in a way consistent with our characterization of product market competition.

摘 要

公司的盈餘傳達產業(industry-wide)及公司特定(firm-specific)的訊息。過去對於以盈餘為基礎之資訊移轉 (earnings-based information transfer) 的研究發現公司宣告好的(壞的)盈餘消息對於其他相同產業而未宣告消息的公司之股票價格有正向(負向)的影響。這樣的結果顯示,在同一產業下,某家公司的盈餘所隱含與產業相關的訊息會移轉到相關的公司並影響其股價。然而,將產業視為一個整體來探討資訊移轉效果,模糊了公司間因市場競爭之差異所引起的資訊移轉,因此,一公司的盈餘是否對其競爭者的預期盈餘有不同的資訊內涵,仍然未知。本研究假設同產業公司間的資訊移轉與公司間的競爭型態有關,並藉此假說來研究這項議題。本研究在探討盈餘資訊移轉與產業競爭的關係,即非宣告公司股票價格的變動是受該公司與盈餘宣告公司間的策略競爭型態所影響。公司的盈餘顯示公司所採取策略後所實現的成果(realized outcome),當一家公司宣布盈餘時,若實際盈餘高於預期盈餘顯示公司最初所採取的行動之結果是優於(劣於)投資人的預期。因此,投資人會同時修正他們對競爭者未來盈餘的預期,而修正的方向則決定於公司間策略性競爭型態為“策略性的替代”(strategic substitutes)或“策略性的互補”(strategic complements)。本研究提出的假說為,若*i*及*j*間為策略性替代關係,當*i*公司的盈餘宣告為負(正)的未預期盈餘(earnings surprise),則資本市場對*j*公司的股價會有正向(負向)的反應;若*i*及*j*間為策略性互補關係,當*i*公司的盈餘宣告為正(負)的未預期盈餘時,資本市場對*j*公司的股票會有正向(負向)的反應。實證結果顯示一公司的盈餘所隱含與產業有關的資訊會在宣告盈餘時移轉給競爭者,與既有之文獻預期相符。但實證結果並未發現盈餘的資訊移轉與策略競爭的型態的關係與預期相符。

I. Introduction

A company's earnings convey information about industry-wide trends and firm-specific conditions. Prior studies on earnings-based information transfers find that good (bad) earnings news announced by a firm has a positive (negative) average impact on the security prices of other non-announcing firms in the same industry¹. This implies that information about *industry-wide* news contained in one firm's earnings is transferred to related firms and capitalized in their security prices. However, examining average information transfers by taking the industry as a whole masks the potential information transfers that arise from market structure distinctions among firms. Thus, it is unclear whether one firm's earnings news conveys *different* information about its competitors' expected earnings. For example, does the increase in the volume of cars sold by Ford necessarily lead to favorable price reactions of all other carmakers? This issue is of interest because how earnings announcement of one firm may provide favorable or unfavorable signals about its competitors' future cash flows is not well understood in the literature. This study investigates this issue by hypothesizing that information transfers among firms within the same industry are associated with the types of strategic competition among firms.

We approach this issue by establishing an informational link between firm-specific information contained in an announcing firm's earnings and other non-announcing firms' competitive positions within the industry. That is, the impacts of the earnings news on non-announcing firms depend on their strategic competition with the announcing firm. Strategic competition is categorized as "strategic substitute" or "strategic complement" based on the concept introduced by Bulow et al.[1985].² Intuitively, when firm i takes aggressive actions, firm j can either choose to 'stay put' or to 'fight'. When firm j 's best response is to accommodate firm i 's aggressive actions, this situation is referred to as competition in strategic substitutes. In this case, firm i 's aggressive actions will increase firm i 's market share and profits, but decrease those of firm j . On the other hand, when firm j 's best response is to fight against firm i 's aggressive actions, this situation is referred to as competition in strategic complements. In this case, firm i 's and firm j 's market share may remain the same and their profits should both rise or fall in the same direction. This study argues that reported earnings reveal the realized outcome of the strategies adopted by a firm. When a firm announces its earnings, a positive (negative) earnings surprise suggests that the outcome of the firm's initial actions is better (worse) than investors expected. Consequently, investors revise their expectations on its competitors' future earnings and the directions of the revisions depend on the nature of strategic competition among firms. Specifically, this study hypothesize that, if firm i and j compete as strategic substitutes, the capital market reacts positively (negatively) on firm j 's stock when firm i announces a negative (positive) earnings surprise. We also hypothesize that, if firm i and j compete as

¹ See for example, Foster [1981], Clinch and Sinclair [1987], Hand and Wild [1990], Freeman and Tse [1992], and Rammath [2002], among others.

² This concept has been applied in finance studies, such as Sundarem, John, and John (1996), Kedia (1999), and Chen, Ho, Ik, and Lee (2002).

strategic complements, the capital market reacts positively (negatively) on firm j 's stock when firm i announces a positive (negative) earnings surprise.

To empirically operationalize the nature of strategic interactions, we modify the procedure introduced by Sundaram et al. [1996] by measuring pair-wise coefficients of correlations between a firm's changes in marginal profit and changes in its rival firm's sales. The competition relation between two firms is identified based on the sign of the correlation. With this measure, we examine the intra-industry firm-specific information transfer effects. We first identify the announcing firms from the Compustat file and categorize their competitors as either strategic complements or strategic substitutes. Then, we test our hypotheses by examining competitors' stock returns around the announcing firms' earnings announcement days. One major alternative hypothesis against the competition argument is the possibility that information transfers could be simply due to the co-movement of the earnings of firm i and firm j (Ramnath [2002]). We investigate this possibility by first, looking at the correlation coefficient of earnings for our sample, and second, test for any information transfers arising from earnings co-movements. In summary, our empirical evidence shows that competitors' stock returns around the announcer's earnings announcement day are significantly positively associated with announcer's earnings surprise. However, we fail to find evidence that intra-industry information transfer is associated with the mode of competition among firms.

Our contribution mainly comes from two folds. First, the firm-specific information transfer is largely missing in the literature on information transfers of earnings announcements³. Foster [1981] is the first to propose two explanations on earnings-based information transfers: 'One possible source of an information transfer arises due to the earnings releases of firm j conveying information about the impact of industry-wide commonalities on firm i Another possible source of an information transfer arises due to the earnings releases of firm j conveying information about the impact of competitive shifts within the industry for firm i '. Obviously, these two sources are not mutually exclusive. However, follow-up studies have devoted much attention to provide evidence consistent with the first stated possibility (Foster [1981], Clinch and Sinclair [1987], Hand and Wild [1990], and Freeman and Tse [1992]). In this study, we explore the second possibility by establish the argument of firm-specific information transfers. The second contribution is that this study empirically measures competitions between two individual firms and extends the empirical work of Sundaram et al. [1996] and Aggarwal and Samwick [1999] in this area.

This paper is organized as follows. Section II summarizes the related literature and develops the hypotheses. Section III describes the procedure of sample selection, the estimation of strategic interactions, and the structure of empirical tests. Section IV summarizes the results and concludes the paper.

II. Literature Review and Hypothesis Development

Studies on earnings-based intra-industry information transfers mainly test for the existence of the information in one firm's announced earnings being transferred to all

³ One exception is a study by Joh and Lee (1992) who investigate the accounting information transfer effect in oligopoly by breaking earnings down into sales and costs.

other firms in the same industry. Therefore, the implicit assumption is that information being transferred is largely limited to the industry-wide commonalities. Two types of research designs have been used in the literature. The first one is by correlating announcing firms' stock prices to non-announcing firms' stock prices on the earnings release dates (Forster [1981], Clinch and Sinclair [1987]). Results from these studies indicate positive associations between unsystematic returns of announcing firms and of non-announcing firms. One main criticism on these studies is that the positive association may arise from a mis-specified unsystematic return-generating model. To avoid this problem, Han and Wild [1990] use a second approach by directly examining the correlation between announcing firms' unexpected earnings and non-announcing firms' stock prices. They find evidence consistent with positive information transfers, on average. Freeman and Tse [1992] further refine research methodology by adopting an industry-earnings model and allowing for variations in the strength of information transfers across industries. Freeman and Tse [1992] conclude that 'earnings-based information transfers of general industry-wide trends are typically small and may be limited to some industries having firms with stronger earnings co-movement'. More recently, Ramnath [2002] uses an industry-forecast-errors model to predict the implication of early announcers' analysts' forecast errors on other firms' forecast errors. This study differs from other studies in that it allows for potential information transfers between two firms. However, since no new theory is proposed to explain why two firms' forecast errors are correlated, this approach appears similar to prior studies that rely on past earnings' co-movements in an industry to predict information transfers. He finds that both analysts and investors underreact to potential information transfers predicted by the historical correlation in forecast errors. One interpretation of this finding is that the cross-sectional correlations in forecast errors may be too unreliable. Overall, to date this research suggests that the capital market recognizes industry-wide co-movement in earnings and that information transfers phenomenon exists.

In addition to conveying industry-wide trends, earnings news contains rich firm-specific information. As noted by Foster [1981] and Freeman and Tse [1992], firm-specific factors can affect the direction of information transfers. Consider an industry where there is little overall growth in total sales, but in which there is intense competition for market share. A report by a major firm in the industry that it had significantly increased its sales and earnings could convey positive information for that firm but negative information for the other firms in the industry. Nevertheless, for an industry where there is huge growth potential for all firms and yet only moderate competition within the industry, good news announced by one firm may also be good news for other firms in the same industry. Therefore, if researchers do not recognize the heterogeneity of competition in these two industries and conduct a test for information transfers in a cross section, the average effect of the good (bad) news on other non-announcing firms could be weak or even zero.

We further extend this line of research by formally incorporating the concept in the oligopoly literature to investigate firms-specific information transfers, which carry information content about the competition in an industry. Competition in an industry can be understood as either 'strategic substitutes' or 'strategic complements.' (Bulow, et al. [1985], Sundaram et al. [1996], Aggarwal and Samwick [1999], among others). Intuitively, when firm i takes aggressive actions such as increases in advertising

expenditures during a quarter, firm j can either choose to ‘stay put’ (i.e. do not increase advertising expenditure) or to ‘fight’ (i.e. increase advertising spending as well). When firm j ’s marginal profit increases with firm i ’s aggressive actions, i.e. $\frac{\partial \pi_j}{\partial S_j} / \frac{\partial S_i}{\partial S_j} > 0$

where π is the profit and S is the output, the best strategy for firm j in response to firm i ’s action is to ‘fight’. If the partial derivative is negative, i.e. $\frac{\partial \pi_j}{\partial S_j} / \frac{\partial S_i}{\partial S_j} < 0$, then firm j ’s best response is to ‘stay put’ because it is not optimal to also increase output.

Industry environment generally determines whether it is optimal for firm j to accommodate or to fight. Specifically, Bulow et al. shows that this decision depends on (1) the overall demand curves in the industry, (2) the cost function of the industry, and (3) whether firms compete on quantity or on price.

When firm j accommodates firm i ’s advertising campaign, firm i ’s market share and profits will rise and firm j ’s profits will decrease. This situation is referred to as competition in strategic substitutes. On the other hand, when firm j fights against firm i ’s advertising campaign, firm i and firm j ’s market share remain constant but their profits may either fall or rise. Profits increase (decrease) for both firms when the overall industry demand increases (remains constant or decreases). This situation is referred as strategic complements. It is commonly assumed that the competition is symmetric; that is, firm i and firm j will compete with each other either as strategic substitutes or strategic complements. However, both types of competition are allowed to exist in one industry.⁴

If firm i and firm j compete as strategic substitutes, the capital market will react to firm i ’s aggressive actions positively when investors know the actions are taken place because they expect higher future earnings/cash flows for firm i . At the same time, stock prices of firm j should decrease because investors lower its earnings expectation. The impact of strategic competition on individual firms’ stock price reactions has been shown in the situation of R&D announcements and new product announcements⁵. For example, Sundaram et al. (1996) and Chen et al. (2002) find that the announcement of a firm’s new strategy changes the value of the firm and of other firms in the same industry. These studies demonstrate how investors form their expectation about the firm’s and its competitors’ prospects when they observe the initiation of a firm’s action.

Follow the same notion, we argue that when firm i announces its actual earnings *ex post*, a positive earnings surprise accompanied with positive price reaction suggests that the outcome of the aggressive actions taken by firm i is better than investors had expected. This conveys a negative signal to the performance of firm j , and may lead to a negative earnings revision for firm j and hence a negative price reaction of firm j . Similarly, if the consequence of firm i ’s action is not as good as investors had expected (i.e. a negative earnings surprise announced by firm i), investors may revise firm j ’s

⁴ As Bulow, Geanakoplos, Klemperer (1985) suggest, small firms in the industry may consider large firms as strategic substitutes, while considering other small firms as strategic complements.

⁵ The importance of strategic competition has also been shown in the context of executive compensation. For example, Aggarwal and Samwick (1999).

earnings upward and induce a positive price reaction of firm j . This suggests the following hypothesis (in alternative form):

H1: *Ceteris Paribus*, when firm i and firm j compete as strategic substitutes, a positive (negative) earnings surprise announced by firm i leads to a negative (positive) price reaction on firm j 's common stocks.

On the other hand, if firm i and firm j compete as strategic complements, investors will react to firm i 's aggressive actions either positively or negatively depending upon whether the expected overall demand of the industry rises or falls. At the same time, stock price movement of firm j will be in the same direction as firm i 's because firm j chooses to take a similar action so that both firms' market shares remain the same and profits rise or fall together. In this case, a positive earnings surprise of firm i conveys a good news to firm j 's earnings, and it should induce a positive earnings revision and a positive stock price reaction for firm j . This suggests following hypotheses (in alternative form) both with regard to investors' reactions:

H2: *Ceteris Paribus*, when firm i and firm j compete as strategic complements, a positive (negative) earnings surprise of firm i announced by firm i leads to a positive (positive) reaction on firm j 's stock prices.

To our knowledge, the closest study to ours is by Joh and Lee [1992]. Although they suggest that an increase in accounting earnings is good news to the disclosing firm but could be either good or bad news to its the competitors, their study does not consider the competition between two firms.

III. Research Design and Results

Most of the prior studies implement the concept of 'industry' by using 4-digit SIC codes (for example, Foster [1981], Sundaram et al. [1996]). However, 4-digit SIC codes may not be a good grouping of product market rivalry; thus, in this study, we use Hoover's Handbook of American Business 2001 as the primary source to define the pool of competitors. Hoover's Inc. is a publisher of business information, whose shares are publicly traded at NASDAQ. It is known for its Hoover's Online, which provides access to its proprietary database covering more than 18,000 public and private companies worldwide, 300 industries and 160,000 corporate executives. Hoover's customers mainly use the database to prospect and prepare for client meetings, sales presentations, vendor and partner negotiations, and business merger and acquisitions. Hoover's competitors section offers a thorough list of competitors handpicked by its editorial staff. The competitors listed reflect all of a company's main business lines and take into account geographic rivalries and specific market segments. Selecting competitors involves judgment calls by Hoover's editorial staff, who gets its data from SEC filings, newspaper

and magazine articles, press releases, company web sites, and directly from the companies themselves.⁶

We require competitors in Hoover's Handbook (2001) to have adequate financial data on Compustat during the 20-quarter estimation period from 1996 to 2000. Since 80.6% of the rivals have the same calendar reporting period with announcers, we do not require synchronized fiscal year periods. Following Sundaram et al. (1996), announcer i compete with rival j as:

strategic substitutes if $Corr(\Delta SALES_{i,q}, \Delta INCOME_{j,q} / \Delta SALES_{j,q}) < 0$, or
 strategic complements if $Corr(\Delta SALES_{i,q}, \Delta INCOME_{j,q} / \Delta SALES_{j,q}) > 0$,

where $\Delta SALES$ and $\Delta INCOME$ are the seasonally differenced sales and earnings before extraordinary items. Change in sales is used as the surrogate for announcer's actions, and the ratio of change in income to change in sales is used as the surrogate for the rival's marginal profit ($\frac{\partial \pi_j}{\partial S_j}$).

This procedure results in usable 302 firms, and there are on average 8.6 rivals for announcer. For example, Walmart has 23 competitors, the maximum number of rivals in our sample.⁷ Unlike the method used by Sundaram et al., this firm-pair correlation does not assume that two firms mutually compete in the same way. For example, in our sample, AMR competes with Southwest as strategic complements, while Southwest competes with AMR as strategic substitutes. This is consistent with the results suggested by Bulow et al. that small firms in the industry may consider large firms as strategic substitutes, while considering other small firms as strategic complements. The reason is that AMR occupies a larger market share in the air line industry. When the major players take aggressive actions such as advertising campaigns, the overall demand of the industry will rise and this benefits small players such as Southwest. On the other hand, when Southwest takes aggressive actions, it is most likely that it takes away AMR's customers. Therefore, southwest competes with AMR as strategic substitutes.

Hypothesis testing is conducted by investigating the price reactions of its substitutes and complements when own firm's earnings are announced. We use analysts' forecasts from I/B/E/S as the empirical measure of investors' earnings expectation. Hypothesis testing is illustrated in the following sequence of earnings announcements in an industry including three firms:

⁶ Hoover's policy of not answering specific researcher's enquires makes it impossible for us to know the exact hand-picking criterion used in this process.

⁷ These rivals are Albertson's, AutoZone, BJ's Wholesale Club, Best Buy, Big Lots, CVS, Circuit City, Dollar General, Family Dollar Stores, Home Depot, Kmart, Kroger, Lowe's, Office Depot, OfficeMax, RadioShack, Rite Aid, Safeway, Staples, TJX, Target, Toys "R" Us, and Walgreen.

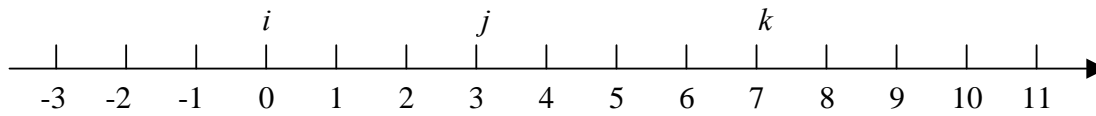


Figure 1

Assume that in this industry firm i and j compete as strategic substitutes, firm i and k compete as strategic complements, and firm j and k also compete as strategic substitutes. Firm i , j , and k announce earnings on day 0, day 3, and day 7 respectively. To test for firm-specific information transfers, we ask whether the distribution of firm j 's abnormal returns on day 0 is negatively associated with firm i 's earnings surprises and whether the distribution of firm k 's abnormal returns is positively associated with firm i 's earnings surprises. When we move on to day 3, we ask a similar question that whether the distributions of firm i 's and firm k 's abnormal returns are negatively associated with firm j 's earnings surprises. However, it is important to measure firm j 's earnings surprises carefully in this case because investors should have revised their expectation conditional on firm i 's earnings announcement. In other words, expected earnings for firm j should only be measured during the period from day 1 to day 2. Similarly, earnings expectation for firm k should be measured using data within the period from day 4 to day 6. For this reason, we require firms to have most recent analysts' forecasts that are issued immediately after preceding earnings announcements of another firm. Another issue is that, when measuring non-announcing firms' abnormal returns, it is important to differentiate market reactions to the announcing firm' earnings surprises from market reactions to these non-announcing firms' own earnings news. Therefore, we drop some non-announcing firms in computing the average abnormal returns of non-announcing firms if these firms' earnings announcements are within one trading day of the announcing firm (Han and Wild [1990]).

This procedure results in three sets of firms: announcing firms, their strategic complements (if any), and their strategic substitutes (if any). For each announcing firm, we find their earnings announcement day, their earnings surprises, and their abnormal returns. For their strategic complements and strategic substitutes, we find their stock price reactions around announcing firms' earnings announcement days. We use a portfolio approach to test our hypotheses.

The OLS regression estimation shows that the coefficient on non-announcing rival firms is significantly positive (with estimated coefficient 0.39 and t-statistics 15.95). This is consistent with prior information transfer literature that good (bad) earnings news announced by a firm has a positive (negative) average impact on the security prices of other non-announcing firms in the same industry⁸ and implies that information about *industry-wide* news contained in one firm's earnings is transferred to related firms and capitalized in their security prices. The estimated coefficient on the interaction between market reaction of rival firms and the strategic substitute indicator is 0.03 with t-statistics 0.76), inconsistent with our first hypothesis. The estimated coefficient on the interaction between market reaction of rival firms and the strategic complement indicator is positive

⁸ See for example, Foster [1981], Clinch and Sinclair [1987], Hand and Wild [1990], Freeman and Tse [1992], and Ramnath [2002], among others.

but insignificant (with estimated coefficient 0.03 and t-statistics 0.76). This is directionally consistent with our second hypothesis but statistically insignificant.

IV. Conclusion

Overall, the evidence from our sample of S&P 500 firms is consistent with prior information transfer literature that industry-wide news contained in one firm's earnings is transferred to related firms. However, we do not find evidence that firm-specific information is transferred in a way consistent with our categorization of product market competition. Further investigation of this issue may be conducted by refining empirical methodology used in characterizing industry rivalry.

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APPENDIX A

Distribution of firms by different classification of industries, 2001

	SP 500	Fortune 500	% fortune	% in ibes
1 FINANCE	77	96	14.9533	19.118
2 HEALTH CARE	44	41	6.3863	11.3238
3 CONSUMER NON-DURA	45	48	7.4766	4.6245
4 CONSUMER SERVICES	59	111	17.2897	15.3893
5 CONSUMER DURABLES	20	28	4.3614	3.4301
6 ENERGY	31	37	5.7632	4.6474
7 TRANSPORTATION	12	23	3.5826	1.5007
8 TECHNOLOGY	112	83	12.9283	21.2465
9 BASIC INDUSTRIES	50	50	7.7882	5.8724
10 CAPITAL GOODS	57	68	10.5919	8.0392
11 PUBLIC UTILITIES	29	57	8.8785	3.4607
99 MISCELLANEOUS/UND	0	0	0	1.2863
0 ????	0	0	0	0.0613
Total	536	642	100	100.0002

APPENDIX B

Industry distribution based on 302 announcers

IND 48	Name	announcer	rivals
1	Agric	0	2
2	Food	8	15
3	Soda	1	2
4	Beer	1	1
5	Smoke	0	0
6	Toys	2	5
7	Fun	1	6
8	Book	4	14
9	HsHol	8	13
10	Clths	5	16
11	Hlth	2	4
12	MedEq	4	8
13	Drugs	9	16
14	Chems	7	16
15	Rubbr	2	6
16	Textiles	0	3
17	BldMt	5	20
18	Cnstr	3	18
19	Steel	4	14
20	Fabricated Products	0	1
21	Mach	7	16
22	Elceq	3	4
23	Autos	5	12
24	Aero	4	5
25	Ships	2	3
26	Gun	1	2
27	Gold	1	1
28	Mines	1	2
29	Coal	0	0
30	Oil	14	35
31	Util	25	63
32	Telcm	10	22
33	PerSv	1	3
34	BusSv	18	44
35	Comps	13	20
36	Chips	17	32
37	LabEq	4	12
38	Paper	6	15
39	Boxes	1	6
40	Trans	7	20
41	WhlSI	11	24
42	RTail	32	64
43	Meals	5	15
44	Banks	23	51
45	Insur	17	31
46	Real Estate	0	0
47	Fin	2	7
48	Other	6	25
		302	714