

Full Length Research Paper

Information transparency and corporate financing decision: Testing the pecking order theory

Kuei-Yuan Wang¹, Yi-Wen Meng^{2*}, Fu-Shiang Huang¹ and Derek Huang²

¹Department of Finance, Asia University, Taichung 41354, Taiwan, Republic of China.

²Department of Business Administration, National Chung Cheng University, Chiayi 62102, Taiwan, Republic of China.

Accepted 3 August, 2011

This research is mainly to study the impact of corporate information transparency on corporate financing decision. The “information disclosure and transparency ranking” survey results by the Securities and Futures Institute (SFI) were incorporated into the regression models to test the pecking order theory. The assumption was that information disclosure would lead to higher transparency, and in turn, higher market efficiency. While the financial deficit gets higher, the debt gets higher too, but does not follow the pecking order theory (management prefer debt financing to equity financing). On the other hand, when taking transparency into consideration, empirical results showed that with lower transparency and higher financial deficit, management is more inclined to follow the pecking order theory. It is apparent that information transparency is a vital indicator for corporations to follow the pecking order theory. Companies with lower transparency might raise debts extensively, and that would further impact on stockholders’ equity inducing a more serious agency problem. Thus, government as well as the corporate world should both promote information transparency and reduce information asymmetry to protect stockholders from suffering adverse selection.

Key words: Transparency, corporate financing decision, pecking order theory, information asymmetry, information disclosure.

INTRODUCTION

At the end of 2001, Enron, then the seventh largest corporation in the United States, filed for Chapter 11 protection. After that, scandals all over the world resulted in various corporate failures and brought up concerns about corporate governance. The Organization for Economic Cooperation and Development (OECD) established five principles of corporate governance, and stressed the importance of information disclosure: "The corporate governance framework should ensure that timely and accurate disclosure is made on all material matters regarding the corporation, including the financial situation, performance, ownership, and governance of the company" (OECD, 2004).

The Securities and Futures Institute (SFI) followed suit and has thus established an information disclosure and transparency ranking system to evaluate all listed

companies in Taiwan, and publishes the yearly survey results on the SFI website.

Capital structure theory has been widely discussed. Modigliani and Miller (1958) proposed the capital structure irrelevancy theory and claimed that capital structure does not affect corporate value or cost of capital under the assumption of a perfect capital market. Later, they modified the theory with the factor of tax shield, and resulted in “capital structure relevancy” (Modigliani and Miller, 1963). Miller (1977) suggests that capital structure has impact on corporate value under the combined effects of corporate tax and personal tax.

Trade-off theory suggests that higher debt ratio will increase the bankruptcy cost and agency cost, thus resulting in a diminishing of tax shield benefit. Thus, a company shall set up its own target leverage considering the trade-offs between tax shield and extra costs to establish an optimal capital structure.

Signaling theory states that there is information asymmetry between management and investors, and

*Corresponding author. E-mail: myw@ocu.edu.tw. Tel: 886-920-064128. Fax: 886-4-27016855/2168.

capital structure gives a signal about company prospects. When a firm adjusts its capital structure, it sends signals to the market. Investors react with their investment decisions, and stock prices fluctuate accordingly. Countering the trade-off theory, Myers (1984) argues for the pecking order theory that after exhausting internal resources, companies prefer debt financing to equity financing.

Myers (1984) and Fama and French (2005) however, indicate that information asymmetry between management and investors is the sole reason for pecking order. Bessler et al. (2011) also supported this viewpoint. This implies that information transparency has its impact on corporate financing decision. Yet, based on the perspective of the debt financing agency problem, excessive leverage will hurt shareholders. This implies that the lower the corporate information transparency, the higher the level of information asymmetry. Then, management prefers debt financing more, and this in turn, worsens the agency problem. If it is a universal phenomenon, then investors may not invest in Taiwan and adverse selection gets more and more serious. This is an urgent important topic to the government. This research focuses on the impact of information transparency on corporate financing decision. Firstly, information transparency and disclosure ranking results in Taiwan are analyzed. Secondly, listed and OTC firms are examined to see if they follow the pecking order theory. Since theoretically, lower information disclosure increases information asymmetry between management and investors, this research intends to check if corporations with lower levels of transparency will be inclined to follow pecking order theory.

The incorporating of novel information transparency disclosure ranking results into analysis provides a significant contribution for further understanding of company behavior.

Furthermore, the implementing of the ranking system will increase information disclosure and reduce information asymmetry. According to empirical results, companies with lower information transparency tend to raise debts for financing requirements. This will induce the agency problem and deteriorating stockholders' equity. While, on the other hand, investors would be unwilling to invest in such companies because they are not able to get information on such companies. This will result in adverse selection. Also, as corporate information transparency improves, the agency problem is minimized, and investors would be involved in the stock market more willingly. The government, on the other hand, may provide better protection to investors, and at the same time keep the market moving.

The plan of this paper is as follows: a brief introduction of corporate information disclosure in Taiwan in the literature review is provided, followed by a description of the data and methodology used. Finally, empirical results are reported and conclusions are drawn from the results.

LITERATURE REVIEW

Corporate information disclosure in Taiwan

Taiwan has been working very hard trying to improve information disclosure and transparency. The Securities Exchange Commission (SEC) announced the "Yearbook Guidelines for Public Trading Companies" in 1988 and made modifications in the later years. Beginning 2003, the SFI is entrusted by the SEC to survey information disclosure on all listed and OTC companies and publish its results on its website. This evaluation is conducted on all companies listed on Taiwan Stock Exchange (TaiEx, these companies are commonly called "Listed") and GreTai Stock Market (these companies are commonly called "OTC"), excluding management stocks (stocks under the custody of supervisors), second tier stocks (stocks in the process of being listed), emerging stocks (stock listed on the emerging market), young stocks (stocks being listed or traded on TaiEx or OTC for less than a year); stocks that have changed their trading methods (including trading that is suspended or terminated); companies that have a chairperson or chief executive officer who is sentenced because of violating business laws (including Stock Trading Act, Company Act, Banking Act, Financial Holding Act, and Commercial Accounting Act) or because of trust-breaching crimes (including corruption, malfeasance in office, fraudulence, breach of trust, and misappropriation); companies that their accountants, when auditing their financial reports, are having reservation recommendations; and companies that are deemed unsuitable to be included in the ranking by the evaluation committee. In 2008, a total of 665 listed companies and 453 OTC companies were included in the performance evaluation.

This ranking incorporates five categories: 1) information disclosure; 2) timing of disclosure; 3) financial projection disclosure; 4) information disclosure in yearbook (including financial and operation information, board structure and shareholder structure); and 5) information disclosure on website.

The "Market Observation Post System" and annual reports are the main sources for corporate information while company websites are the most direct channel for information flow between investors and companies. These five ranking categories match categories used in these resources.

Ranking results are published separately for listed and OTC companies. In the first two years, the SFI, with the intention of encouragement, published only lists of higher transparency companies (the top third of the TSE and OTC companies). Beginning the third year (2005), the performance evaluation results are posted on a quintile list for TSE and OTC companies separately. For encouraging voluntary disclosure, SFI also publishes a "Voluntary Disclosure – Higher Level of Transparency" list and a "Progressing Company" list.

Conducting an information disclosure evaluation survey improves corporate governance through external monitoring to reduce information asymmetry and improve capital market efficiency. Jiang et al. (2009) indicate that timely disclosure of corporate information on the company website reflects a firm's commitment on information transparency. This brings up investor confidence and pushes forward corporate growth. Glosten and Milgrom (1985) indicate that the higher the disclosure, the less information asymmetry, which implies that transparency level is a vital indicator of information asymmetry. Thus, it is proposed that the better the disclosure grading, the higher its transparency, and the less information asymmetry.

Capital structure

Nobel laureates Modigliani and Miller (1958) proposed the "Capital Structure Irrelevance" theory (MM theory), claiming that corporate value is not affected by its financial decision on capital structure. With the addition of corporate tax consideration, however, Modigliani and Miller (1963) later modified their theory to be "Capital Structure Relevance," claiming that the corporate tax creates a tax shield to affect the cost of capital. Even if there might be a minor deviation, market arbitrage would correct it immediately. Both theories are statistically proven but heavily criticized due to unrealistic assumptions.

Myers (1984), considering simultaneously investing, financing, and dividend policies, proposes the pecking order theory arguing that the retained earnings, with the benefits of no interest and less monitoring, is the preferred capital resource. On the other hand, because of information asymmetry, management tends to issue new stocks when stock price is higher, while this is seen as a negative signal to investors. Equity financing has become a delicate issue. Furthermore, agency cost is higher for equity issuance than internal financing or leverage, and since new stocks require dividend payment and dilute earnings, management tends to see equity financing as a last resort. Thus, management has a pecking order of financing selection: internal, debt, and equity. Capital structure is then the result from such trade-off considerations and implications among these options. de Jong et al. (2011) also supported that peck order is a better descriptor of firm's issue decisions.

Empirical results in Taiwan, however, do not necessarily support such a pecking order. Goo et al. (2005) find that information electronic companies in Taiwan prefer common stock to short-term debt, long-term debt, and convertibles. Chan and Chang (2009) tested pecking order with a modified Shyam-Sunder and Myers (1999) model on Taiwanese companies in various industries. Among the sectors they tested, only cement, plastic, rubber, automobiles, transportation, and retail-selling follow pecking order predictions, the others do not.

From exploring the financing theories in the literature; tangibility, growth, firm size and profitability have influences on pecking order theory (Bharath et al., 2009; Frank and Goyal, 2003; Leary and Roberts, 2010). Frank and Goyal (2009) indicate that firms that have more tangible assets tend to have higher leverage. Thus, tangibility might have an impact on financing decisions. On the other hand, they also propose that firms that have a high market-to-book ratio tend to have lower leverage. It implies that growth potential might affect financing decisions. In addition, firm size also matters. Frank and Goyal (2003) claim that big companies, because of better reputation and lower information cost, use more leverage.

Their later study (Frank and Goyal, 2009) however shows that big companies do not need debt financing as much because they have more retained earnings. Research by de Jong et al. (2010) concurs that company size has an impact on financing decision. Fama and French (2002) and Frank and Goyal (2009) point out that profitable companies use leverage less. Therefore, financing decision is affected by profitability.

In addition, Frank and Goyal (2009) show that managers often use industry median leverage as a benchmark when they are making financing decisions. Companies in the same industry tend to use similar financing tools. It is implied that industry often decides financing decisions. In conclusion, financing preference is affected by industry, tangibility, growth, firm size and profitability. We hereby propose our first hypothesis:

H₁: After controlling industry, tangibility, growth, firm size and profitability, listed firms in Taiwan follow pecking order theory (management prefers debt financing to equity financing) in making financing decisions.

Frank and Goyal (2003) claim that the worse the information asymmetry, the more the management prefers pecking order in financing decisions. Fama and French (2005) indicate that the reason for pecking order that Myers (1984) proposed is information asymmetry. When repurchasing its own stock, a company has to consider its own debt capacity, which is often limited, while equity financing availability seems to be ubiquitous. Pecking order is seriously challenged. Fama and French (2005) propose that employee shares, employee stock options, share repurchase, or stock swap at mergers and acquisitions (M&A) can strengthen equity issuance at low cost and information asymmetry to avoid higher cost from the pecking order. Such an explanation suggests that equity financing might not be the least preference. Lemmon and Zender (2007) suggest taking into consideration financial slack and financial deficit avoidance, smaller but high growth companies following pecking order theory can explain management preference when considering debt capacities because of their limited debt resource. Nonetheless, both Myers (1984), Fama and French (2005) and Bessler et al. (2011) agree that information asymmetry is a very important impact factor

on making financing decisions.

As many scholars support information asymmetry being an important impact factor on financial decision-making, this study proposes that corporations with lower information disclosure ranking are less transparent and have higher information asymmetry. The pecking order theory (management prefers debt financing to equity financing) is more inclined to get supported. Thus, we have our second hypothesis as:

H₂: The lower the information transparency, the higher the possibility the pecking order is supported (management prefers debt financing to equity financing).

METHODOLOGY

Sample and data

We started with 5,043 samples from listed and OTC stocks between 2005 and 2008. Following guidelines for Information Disclosure Ranking, we excluded samples that are listed less than a year (265 samples) and that changed their trading methods (447 samples), resulting in a total of 4,331 samples (2,581 listed and 1,750 OTC). An extraction of companies in the financial and insurance industry (180 samples) due to their special features resulted in 4,151 samples. A further dropping of 79 samples with missing data resulted in the final number of 4,072 samples.

This screening process yields a total of 882 companies. Industry distribution of the samples includes tourism (5 companies), cement (11), food (22), plastics (35), textiles (24), glass and porcelain (4), paper (4), rubber (5), construction and materials (34), electric engineering and machinery (32), electrical appliances and cables (10), iron and steel (35), automobiles (8), transportations (34), merchandise trading (12), chemical engineering (33), biotech and medicals (30), energy (6), information electronics (500), and others (38).

Models

Pecking order theory

We constructed a modified Shyam-Sunder and Myers (1999) model (Equation 1) to incorporate control variables including industry, profitability, and size in testing the pecking order theory:

$$\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \beta_3 \times INDUSTRY_{it} + \beta_4 \times TANGIBILITY_{it} + \beta_5 \times MTB_{it} + \beta_6 \times SIZE_{it} + \beta_7 \times ROE_{it} + \varepsilon_{it} \quad (1)$$

where, ΔL_{it} represents the total variation of long-term debt for i company i in year t. $INDUSTRY_{it}$ represents the industry code for i company. We use here the two-digit coding. $TANGIBILITY_{it}$ represents the tangibility of assets for i company i in year t, and is calculated by dividing fixed assets by total assets. MTB_{it} represents the growth of the firm, and this study follows the method of Chung and Pruitt (1994) to calculate as: (market values of common stock + market values of preferred stock + long-term liabilities + current liabilities – current assets) / total assets. $SIZE_{it}$ represents the firm size of i company i in year t. This is calculated as the natural logarithm of total assets. ROE_{it} represents the profitability for i company i in year t. We use here the return on equity (ROE) as its proxy, and it is calculated as net profit / stockholders equity. DEF_{it}

represents the total financial deficit for i company i in year t. This is calculated with the following equation (Shyam-Sunder and Myers, 1999):

$$DEF_{it} = DIV_{it} + X_{it} + \Delta W_{it} + R_{it} - C_{it}$$

where, DIV_{it} represents the dividend payment by company i in year t. X_{it} represents the capital expenditures for company i in year t. ΔW_{it} represents the net increasing working of operating capital for company i in year t. R_{it} represents the current portion of long-term debt at start of period for company i in year t. C_{it} represents the operating cash flows, after interest and taxes for company i in year t.

As pecking order theory claims that managers prefer debt to equity financing when there is a need for external resources, the company that follows pecking order will seek debt financing to cover its financial deficit (DEF_{it}). Such company i in year t will have a significantly positive β_1 , and this β_1 will be close to 1.

Information transparency and pecking order theory

For testing if the company would follow pecking order theory (management prefers debt financing to equity financing) when it has lower information transparency, this study incorporates an interaction term of financial deficit and transparency. If β_1 is significantly positive and approaching 1, Hypothesis 2 is supported. That is to say, pecking order theory is supported among low transparency companies. The regression model is:

$$\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \beta_1 \times DEF_{it} \times CIT_{it} + \beta_3 \times INDUSTRY_{it} + \beta_4 \times TANGIBILITY_{it} + \beta_5 \times MTB_{it} + \beta_6 \times SIZE_{it} + \beta_7 \times ROE_{it} + \varepsilon_{it} \quad (2)$$

where, CIT_{it} represents the corporate information disclosure evaluation survey grading. We use a three level grading instead of the quintile system used by the SFI. The high transparency group is denoted 3 (representing those with A+ and A grading), the medium transparency group is denoted 2 (representing those with B grading), and the low transparency group is denoted 1 (representing those with C and C- grading).

EMPIRICAL RESULTS

Descriptive statistics

Information disclosure in Taiwan

i) Transparency is gaining more attention in Taiwan: information disclosure survey gradings between 2005 and 2008 are listed in Table 1. The number of companies graded A+ or A has increased from 159 (16.84%) in 2005 to 326 (30.41%) in 2008 while companies graded C or C- decreased from 241 (25.53%) in 2005 to 116 (10.82%) in 2008. This trend shows clearly that listed companies are doing better in disclosure grading, which, in turn, shows that companies are putting in more efforts on promoting information transparency.

Table 1. Information disclosure grading on listed companies.

Year	Grade					Total
	A ⁺	A	B	C	C-	
2005	5	154	544	241	0	944
2006	8	192	588	195	31	1,014
2007	8	189	548	245	52	1,042
2008	24	302	630	104	12	1,072
Sub-total	45	837	2,310	785	95	4,072
Percentage	1.11	20.56	56.73	19.28	2.33	100.00

Table 2. Transparency evaluation ranking results by CIT (high-tech, traditional, and other industries).

Industry	Year	A ⁺	A	B	C	C-	Total (%)
		n (%)	n (%)	n (%)	n (%)	n (%)	
High-tech Industry	2005	3(0.52)	101(17.60)	372(64.81)	98(17.07)	0(0.00)	574(100)
	2006	6(0.96)	117(18.69)	401(64.06)	94(15.02)	8(1.28)	626(100)
	2007	4(0.62)	117(18.00)	387(59.54)	123(18.92)	19(2.92)	650(100)
	2008	16(2.35)	199(29.22)	414(60.79)	49(7.20)	3(0.44)	681(100)
	Total	29(1.15)	534(21.10)	1,574(62.19)	364(14.38)	30(1.19)	2,531(100)
Traditional Industry	2005	2(0.62)	49(15.08)	146(44.92)	128(39.38)	0(0.00)	325(100)
	2006	2(0.59)	68(20.12)	159(47.04)	87(25.74)	22(6.51)	338(100)
	2007	3(0.88)	62(18.29)	140(41.30)	102(30.09)	32(9.44)	339(100)
	2008	7(2.08)	88(26.19)	179(53.27)	53(15.77)	9(2.68)	336(100)
	Total	14(1.05)	267(19.96)	624(46.64)	370(27.65)	63(4.71)	1,338(100)
Others	2005	0(0.00)	4(8.89)	26(57.78)	15(33.33)	0(0.00)	45(100)
	2006	0(0.00)	7(14.00)	28(56.00)	14(28.00)	1(2.00)	50(100)
	2007	1(1.89)	10(18.87)	21(39.62)	20(37.74)	1(1.89)	53(100)
	2008	1(1.82)	15(27.27)	37(67.27)	2(3.64)	0(0.00)	55(100)
	Total	2(0.99)	36(17.73)	112(55.17)	51(25.12)	2(0.99)	203(100)

ii) High-tech companies perform better on information transparency than traditional companies: comparing high-tech and traditional companies in different years (Table 2), we can see that high-tech companies ranking A⁺ or A have risen from 104 (18.12%) in 2005 to 215(31.57%) in 2008. At the same period of time, traditional companies rise from 51 (15.7%) in 2005 to 95 (28.27%) in 2008. This shows that both high-tech and traditional companies have performed better, and both are rising at about the same rate. On the other hand, the C or C- ranking companies decreased from 98 (17.07%) in 2005 to 62 (18.45%) in 2008 for traditional companies, they also have a similar rate. This shows that both high-tech and traditional companies are trying to improve their transparency.

Between 2005 and 2008, there are 563 (22.25%) high-tech companies ranked A⁺ or A, 1,574 (62.19%) are B, and 394 (14.82%) are C or C-. Those numbers are 281 (21.01%), 624 (46.64%), and 433 (32.36%), respectively

for traditional companies. Such an empirical result shows that high-tech companies are doing better than traditional companies in information transparency.

From these empirical results, we conclude that both high-tech and traditional companies are following government policies in promoting their information transparency and improving market efficiency. Further comparison shows that high-tech companies are doing better in promoting transparency than traditional companies.

Descriptive statistics

We use descriptive statistics to investigate characteristics of companies at different levels of transparency. The results shall provide good indices for government and investors. Pooling all samples, we get a mean (ΔL) of 99,669, and mean (DEF) of 167,996.35 (Table 3). This is

Table 3. Descriptive statistics.

Variable	n	Mean	SD.	Min	Max
ΔL	4,072	99,669	3,028,180	-28,779,243	91,657,813
DEF	4,072	1,679,96	6,181,260	-82,792,706	154,000,000
CIT	4,072	2	0.66	1	3
INDUSTRY	4,072	20.34	9.06	1	31
TANGIBILITY	4,072	0.22	0.18	0	0.96
M/B	4,072	0.29	0.28	-0.61	2.65
SIZE	4,072	15.20	1.31	12.14	20.29
ROE	4,072	0.07	0.17	-1.44	0.59

Table 4. Descriptive statistics by CIT.

Variable		n	Mean	SD.	Min	Max
ΔL	CIT=1	880	74,233	2,831,920	-17,461,983	70,172,481
	CIT=2	2,310	74,459	3,024,210	-28,779,243	91,657,813
	CIT=3	882	191,074	3,223,420	-18,589,605	31,487,682
DEF	CIT=1	880	365,132	4,795,210	-14,921,596	121,000,000
	CIT=2	2,310	185,624	5,454,590	-61,908,609	154,000,000
	CIT=3	882	-74,860	8,691,160	-82,792,706	78,537,031
CIT	CIT=1	880	1	0	1	1
	CIT=2	2,310	2	0	2	2
	CIT=3	882	3	0	3	3
INDUSTRY	CIT=1	880	17.6625	9.5686	1	31
	CIT=2	2,310	21.3108	8.6947	1	31
	CIT=3	882	20.449	8.9542	1	31
TANGIBILITY	CIT=1	880	0.26	0.20	0	0.96
	CIT=2	2,310	0.21	0.17	0	0.87
	CIT=3	882	0.21	0.17	0	0.86
MTB	CIT=1	880	0.38	0.29	-0.54	1.58
	CIT=2	2,310	0.28	0.28	-0.61	2.65
	CIT=3	882	0.24	0.26	-0.55	1.06
SIZE	CIT=1	880	14.85	1.10	12.46	19.84
	CIT=2	2,310	15.08	1.19	12.14	20.29
	CIT=3	882	15.87	1.57	12.61	20.13
ROE	CIT=1	880	0.03	0.16	-1.31	0.46
	CIT=2	2,310	0.07	0.17	-1.44	0.51
	CIT=3	882	0.09	0.15	-1.05	0.59

to say that, on average, most companies have financial deficit and are in debt.

For further investigating companies with different levels of transparency, we separate companies into three groups: high transparency (survey grading A+ or A), medium

transparency (survey grading B), and low transparency (survey grading C or C-). Statistics for the grouping data are shown in Table 4. Mean ΔL for each group is 74,233, 74,459, and 191,074, respectively, showing that the higher the corporate transparency, the more it tends to raise

Table 5. Pearson correlation matrix.

Variable	L	DEF	INDUSTRY	TANGIBILITY	MTB	SIZE	ROE	CIT
L	1							
DEF	0.49***	1						
INDUSTRY	0.01	-0.01	1					
TANGIBILITY	0.06***	0.04***	-0.26***	1				
MTB	0.03*	-0.01	-0.23***	0.444***	1			
SIZE	0.11***	0.08***	-0.14***	0.07***	-0.02	1		
ROE	0.01	0.04**	0.07***	-0.18***	-0.55***	0.14***	1	
CIT	0.01	-0.02	0.010***	-0.09***	-0.17***	0.26***	0.12***	1

*, **, *** represents significant level as 0.1, 0.05, and 0.01, respectively.

debt rather than issue stock. On the other hand, the respective mean DEF is 365,132, 185,624, and -74,860, which shows that the lower the corporate transparency, the more financial deficit it has. Firms with high transparency have negative DEFs, representing lower financial deficit. Thus, corporate transparency has an impact on financial deficit. From the above empirical results, it can be inferred that it is difficult to raise money through debt financing for corporations with lower transparency. On the contrary, investors or financial institutions are more inclined to lend to a company with higher transparency. Thus, such companies more easily solve their financial deficit problem by raising debt.

Mean TANGIBILITY for the three groups are similar at 0.26, 0.21 and 0.21, while MTB are 0.38, 0.28, and 0.24 respectively. This shows that the higher its transparency, the lower growth rate it shows. Companies with lower transparency show higher growth rates. It seems that companies with higher growth rates tend to be those at the growth stage in their life cycle. They may not have much information to disclose, or are incapable of disclosing, thus resulting in lower transparency. On the other hand, companies with lower growth rates are more inclined to be those older and more capable of disclosing, thus resulting in higher transparency. Mean SIZE is 14.85, 15.08, and 15.87, respectively, which shows that firms with lower transparency are relatively smaller in size while corporations with higher transparency tend to be bigger. It might be that smaller companies tend to be younger, without much information or capability to disclose while bigger companies tend to be longer-lived and have more information and capability.

The Mean ROE is 0.03, 0.07, and 0.09 for each group. It shows that the lower the transparency, the smaller its ROE; the higher the transparency, the higher its ROE. It can be inferred that when a company exhibits higher transparency, both debt holders and investors are more inclined to provide financial resources. The company would thus enjoy higher profitability.

Correlation analysis

In Table 5, the result that ROE and CIT show a positive

correlation, significantly implies that the higher the transparency, the higher its profitability; while, on the contrary, the lower its transparency, the worse its profitability. This can be a valuable piece of information for investors.

CIT and SIZE are significantly positively correlated (0.26). This shows that bigger companies are more transparent, while small companies are less transparent. A small company is less transparent because it is more often than not a new company that does not have information to disclose or is unable to disclose. That CIT, TANGIBILITY, and MTB are all negatively related shows that companies with lower transparency might be new ones, and they need to spend more on fixed assets which will create higher growth in the future. Therefore, this also can be a valuable piece of information for investors.

SIZE and DEF are significantly positively correlated (0.08). It seems that the bigger its size, the more funding a firm would need to support its operation, and hence, increases its financial deficit. Yet, the result that SIZE and ROE show a significant positive correlation (0.12) means the bigger its size, the higher a firm's profitability. Also, from these results, it is concluded that companies with lower transparency tend to be smaller and have higher financial deficit but lower profitability.

MTB and TANGIBILITY are significantly negatively correlated. This implies that higher growth companies invest more on their fixed assets. TANGIBILITY and DEF being significantly positively related shows that fixed assets investment will result in the increase of financial deficit. DEF and ROE show a significant, positive correlation (0.04). It can be inferred that corporations with higher profitability tend to invest more and thus increase their financial deficit. The facts that both DEF and L and TANGIBILITY and L are significantly positively correlated provide further evidence that the fixed assets investment comes from the increase of long-term debt, and MTB and L being significantly positively related proves that long-term debt increase will improve growth rate. MTB and ROE being significantly negatively related could result from the fact that companies with higher growth rates are often those at the earlier stage of their life cycle. These companies are spending on various assets but

Table 6. After considering CIT, pecking order theory holds.

Variable	Model 1	Model 2
INTERCEPT	-3136186*** (-6.08)	-2238130*** (-4.66)
DEF	0.24*** (35.45)	0.77*** (35.17)
DEF×CIT	-	-0.23*** (-25.33)
INDUSTRY	13844*** (2.89)	11212** (2.51)
TANGIBILITY	562029** (2.17)	353139 (1.47)
MTB	345857* (1.77)	391100** (2.16)
SIZE	182,770.31*** (5.69)	121235*** (4.05)
ROE	-417,581.93 (-1.64)	11825 (0.04)
F-value	225.25	315.20
α	0.00	0.00
R ²	0.25	0.35
adj- R ²	0.25	0.35
DW	2.21	2.16
VIF (a,b)	(1.01, 1.78)	(1.06, 12.37)
n	4072	4072

$\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \beta_2 \times DEF_{it} \times CIT_{it} + \beta_3 \times INDUSTRY_{it} + \beta_4 \times Tangibility_{it} + \beta_5 \times MTB_{it} + \beta_6 \times SIZE_{it} + \beta_7 \times ROE_{it} + \varepsilon_{it}$ Model 1
 $\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \beta_2 \times DEF_{it} \times CIT_{it} + \beta_3 \times INDUSTRY_{it} + \beta_4 \times Tangibility_{it} + \beta_5 \times MTB_{it} + \beta_6 \times SIZE_{it} + \beta_7 \times ROE_{it} + \varepsilon_{it}$ Model 2
 2*, **, and *** shows significance at 0.1, 0.05, and 0.01, levels respectively.

unable to generate earnings or profits. Although they have negative ROE, they might have a brighter future.

Regression analysis

Pecking order theory

Regression model 1 (Table 6) has an adj-R² of 0.25, F-value of 225.25, Durbin-Watson value of 2.21, and VIF of (1.01, 1.78). Regression results show that DEF is significantly positive correlated with ΔL . This is to say, when the financial deficit increases, a company is more inclined to raise debt; and for every 1 unit of financial deficit increase, the long-term debt amount variation increases by 0.24. The regression coefficient, however, does not get near 1; thus, this result does not support H₁.

Regression model 2 shows that, after adding the interaction term DEF x ΔL , the adj-R² is 0.35, F-value is 315.20, Durbin-Watson value of 2.16, and VIF is (1.06, 12.37). All but the interactive factor has a VIF smaller than 10. These empirical results show that DEF is significantly positively correlated with ΔL , and its regression coefficient is near 1. For every 1 unit of long-term debt variation increase, there is a 0.77 unit increase in financial deficit. Also, the interaction term showing a significant negative correlation implies that the lower its transparency and the higher its financial deficit, a company is more inclined to use debt financing. This supports the pecking order theory. H₂ is supported.

From the results of these two models, without information transparency, pecking order is not supported, yet with the addition of the interaction term transparency,

the pecking order is suddenly fully supported. This implies that companies with lower transparency and higher deficits are more inclined to follow the pecking order theory. Such a company is prone to the agency problem, and shareholders might get hurt more easily. Investors should avoid investing in these companies while government should push these companies to increase their transparency to avoid adverse selection and to promote market efficiency. This empirical result supports that information transparency has a vital importance in pecking order theory, and it supports the claim by Myers (1984), Fama and French (2005) and Bessler et al. (2011) that information asymmetry is an important variable. This is also a major contribution of this research.

At the same time, company size is significantly positive correlated with the total amount of variation of long-term debt. This implies that the bigger the company size, the more it raises debt. In addition, MTB and TANGIBILITY are also significantly positively correlated with the total amount of variation of long-term debt. This implies that companies with higher growth rates often need higher levels of fixed assets investment, which tend to be financed through long-term debt.

Information transparency vs. pecking order theory

The study further grouped samples into three groups of low-, medium-, and high-transparency to do regression analyses separately. The results (Table 7) show adj-R² are 0.56, 0.45, and 0.03; F-values are 190.43, 312.78 and 5.08; Durbin-Watson values are 2.00, 2.17, and 2.10; and VIF are (1.07, 1.70), (1.02, 1.51), and (1.00, 1.29),

Table 7. The company with lower transparency shows higher debt financing tendency.

Variable	CIT=1	CIT=2	CIT=3
INTERCEPT	581319 (0.59)	-1234946** (-1.94)	-4424083*** (-3.73)
DEF	0.45*** (32.75)	0.37*** (42.61)	0.05*** (3.71)
INDUSTRY	13323* (1.88)	4136.10 (0.73)	14849 (1.17)
TANGIBILITY	662596* (1.86)	309166 (1.01)	-251213 (-0.36)
MTB	390464 (1.38)	312350 (1.39)	567102 (1.05)
SIZE	-82336 (-1.32)	66194 (1.65)	266419*** (3.72)
ROE	-136843 (-0.29)	36787 (0.11)	26793 (0.03)
F-value	190.43	312.78	5.08
α	0.00	0.00	0.00
R ²	0.57	0.45	0.03
adj-R ²	0.56	0.45	0.03
DW	2.00	2.17	2.10
VIF (a, b)	(1.07, 1.70)	(1.02, 1.51)	(1.00, 1.29)
No. of Samples	880	2310	882

*, **, and *** shows significance at 0.1, 0.05, and 0.01 levels respectively.

Table 8. After considering CIT, pecking order theory still holds without control variables.

Variable	Model 3	Model 4
INTERCEPT	59,277 (1.43)	25491 (0.66)
DEF	0.24*** (35.94)	0.78*** (35.71)
DEFxCIT	-	-0.23*** (-25.71)
F-value	1,291.41	1,080.99
α	0.00	0.00
R ²	0.24	0.35
adj-R ²	0.24	0.35
DW	2.21	2.16
VIF (a,b)	(1.00)	(12.24, 12.24)
No. of Samples	4072	4072

$\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \epsilon_{it}$ Model 3;
 $\Delta L_{it} = \beta_0 + \beta_1 \times DEF_{it} + \beta_2 \times DEF_{it} \times CIT_{it} + \epsilon_{it}$ Model 4. *, **, and *** shows significance at 0.1, 0.05, and 0.01 levels, respectively.

respectively.

Regression analysis results show that the three coefficients of DEF are all significantly positively related to the ΔL . Further analysis shows that the lower its transparency, the higher a company's long-term debt variation which means the company with lower transparency tends to exhibit a higher debt financing tendency. It also implies that company with lower transparency is relatively more inclined to follow pecking order. Therefore, the empirical result supports H₂.

On studying the relationship between SIZE and ΔL , the empirical results show that SIZE has significant impact on ΔL in the CIT3 group, but the bigger the SIZE, the lower its effect on ΔL . It may even be negative. This is to say that a bigger company requires relatively more funds in operation. When it has higher transparency, banks or debt

holders are more willing to provide loans to the company, thus resulting in a higher long-term debt variation.

DISCUSSION

Testing pecking order theory with the Shyam-Sunder and Myers model (1999), we get adj-R² of 0.24, F-value of 1291.41, and Durbin-Watson value of 2.21 (Table 8). Regression analysis results show that financial deficit is significantly positively correlated with long-term debt variation. For every unit of financial deficit increase, the long-term debt variation increases by 0.24 units. However, the regression coefficient is not close to 1. So, H₁ is not supported. After controlling industry, tangibility, profitability, size and ROE, companies in Taiwan support pecking

Table 9. Without control variables, the company with lower transparency shows higher debt financing tendency.

Variable	CIT=1	CIT=2	CIT=3
INTERCEPT	-86,950 (-1.366)	5,655 (0.121)	194491* (1.81)
DEF	0.44*** (33.34)	0.37*** (43.19)	0.05*** (3.68)
F-value	1,111.65	1,865.12	13.53
α	0.00	0.00	0.00
R ²	0.56	0.45	0.02
adj-R ²	0.56	0.45	0.01
DW	2.01	2.17	2.09
VIF (a, b)	880	2310	882

*, **, and *** shows significance at 0.1, 0.05, and 0.01, levels respectively.

order theory. This result is comparable to that of Model 1 in Table 6.

Model 4 is a result of adding an interaction term of two effects, financial deficit and transparency, into Model 3. The results show that adj-R² increases to 0.35, F-value 1080.99, Durbin-Watson value 2.16, and VIF 12.24. The VIF is greater than 10 because the variable is an interaction between the main effect and the interaction effect. The regression result shows that for every unit of financial deficit increase, long-term debt amount variation increases 0.78. The interaction term showing significant negative correlation implies that the less its transparency and higher its financial deficit, a company is more inclined to follow the pecking order. This set of empirical results is comparable to Model 2 in Table 6.

In Table 9, regrouping samples into low-, medium-, and high- transparency, and re-testing them with Shyam-Sunder and Myers (1999) models, this study shows similar results as listed in Table 7. The lower its information transparency, the higher its variation on total long-term debt, a company is relatively more inclined to raise debt.

Conclusions

This study takes into consideration the relationship between corporate information transparency and financing decisions. Past researches have shown that information asymmetry has an impact on corporate financing decisions (Bharath et al., 2009; Leary and Roberts, 2010; Bessler et al., 2011). This research, following those leads, incorporates a direct and credible novel ranking result, instead of taking a proxy (for example, Bessler et al. (2011) utilized analysts' forecasts), into our model to analyze the impact of information transparency on corporate financing decision-making.

Our empirical results show that information transparency is gaining emphasis from most companies in Taiwan. When the financial deficit is increasing, companies tend to seek debt financing more, but this tendency doesn't significantly support the pecking order

theory. However, after adding the information transparency as an interaction term, the pecking order theory is supported in that corporations with lower transparency and higher financial deficit tend to use debt financing more. Apparently, information transparency is a very important impact factor in pecking order theory. This empirical result not only supports that information asymmetry is a vital factor in pecking order theory (Myers, 1984; Fama and French, 2005; Bessler et al., 2011), but also represent a major contribution of this research.

The reason may be inferred that companies in Taiwan do not care much about the cash flow, which would often lead to higher financial deficit. Therefore, financial deficit increases as operating cash flow decreases. When companies have lower profits, hence lower cash flow, internal financing become less possible. They will need more outside financial resources. The only way for these companies to raise capital is to issue debts. Thus, empirical results show that financial deficits alone will only increase the long-term debt amount variation, but it does not result in following pecking order theory. After incorporating information transparency (CIT), however, pecking order theory is suddenly supported. It is inferred that the lower the transparency, the worse the information asymmetry, so investors are less willing to subscribe to its equity. The company is then forced to issue debt to satisfy its needs for capital. Hence, the pecking order theory is supported.

Although our empirical results show that companies with lower information transparency tend to follow pecking order theory and use debt financing. However, such a high leverage will induce conflict of interests between stockholders and debt holders. On the contrary, firms with higher transparency will be less in debt, both shareholders and debt holders get more information about company operations, information asymmetry is reduced, and the agency problem is lessened, too. Besides, with easy access to corporate information, investors are less prone to adverse selection, and thus, are more willing to take part in market activities. The result is better protected investors and a highly active market. So, government should push for higher corporate information transparency,

and investors should avoid investing in companies with lower transparency.

Although corporate information transparency has been a focus in corporate governance recently, and the SEC implemented an information disclosure and transparency ranking scheme in 2003, the SEC only provided lists of companies with higher transparency in the first two years. A quintile ranking system was not available until the third year in 2005. This research is thus limited to a 4-year period between 2005 and 2008. An extended research duration might bring up more concrete insights.

Also, this research did not take into consideration earning dilution problems in equity financing, nor did we consider the ability a company has in raising debt. Further research shall incorporate these factors into the models.

ACKNOWLEDGEMENTS

This study was supported by National Science Council in R.O.C. under Grant No. NSC98-2815-C-468-023-H. We acknowledge the helpful comment and suggestions from the anonymous reviewers and the editor.

REFERENCES

- Bharath ST, Paolo P, Guojun W (2009). Does Asymmetric Information Drive Capital Structure Decisions? *Rev. Financ. Stud.*, 22(8): 3211-3242.
- Bessler W, Drobetz WD, Grüninger MC (2011). Information Asymmetry And Financing Decisions. *Int. Rev. Financ.*, 11(1): 123-154.
- Chan CH, Chang WZ (2009). Pecking Order Models with Bending Point: An Empirical Study of Capital Structure in Taiwan. *Soochow J. Account.*, 1(2): 37-61.
- Chung KH, Pruitt SW (1994). A Simple Approximation of Tobin's Q. *Financ. Manage.*, 23(3): 70-74.
- de Jong A, Verbeek M, Verwijmeren P (2010). The Impact of Financing Surpluses and Large Financing Deficits on Tests of the Pecking Order Theory. *Financ. Manage.*, 39(2): 733-756.
- de Jong, A, Verbeek M, Verwijmeren P (2011). Firm's debt-equity decisions when the static tradeoff theory and the pecking order theory disagree. *J. Bank. Financ.*, 35(5): 1303-1314.
- Fama EF, French KR (2005). Financing Decisions: Who Issues Stock? *J. Financ. Econ.*, 76(3): 549-582.
- Frank MZ, Goyal VK (2003). Testing the Pecking Order Theory of Capital Structure. *J. Financ. Econ.*, 67(2): 217-248.
- Frank MZ, Goyal VK (2009). Capital Structure Decisions: Which Factors are Reliably Important? *Financ. Manage.*, 38(1): 1-37.
- Glosten L, Milgrom P (1985). Bid, Ask, and the Transaction Prices in a Specialist Market with Heterogeneously Informed Traders. *J. Financ. Econ.*, 14(1): 71-100.
- Goo YJ, Cheng MT, You JL (2005). A Research on Priority of Financing Decision of Taiwan Listed Technology Companies: The Application of Ordered-Logistic Regression Model. *Fu Jen Manage. Rev.*, 12(3): 41-69.
- Jiang Y, Raghupathi V, Raghupathi W (2009). Content and Design of Corporate Governance Websites. *Inform. Sys. Manage.*, 26(1): 13-27.
- Leary M, Roberts MR (2010). The Pecking Order, Debt Capacity, and Information Asymmetry. *J. Financ. Econ.*, 95: 332-355.
- Lemmon M, Zender J. (2007). Debt Capacity and Tests of Capital Structure Theories. Working Paper, University of Utah and University of Colorado at Boulder.
- Miller MH (1977). Debt and Taxes. *J. Financ.*, 32(2): 261-275.
- Modigliani F, Miller MH (1958). The Cost of Capital Corporate Finance and the Theory Investment. *Amer. Econ. Rev.*, 48(3): 261-297.
- Modigliani F, Miller MH (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *Amer. Econ. Rev.*, 53(3): 433-443.
- Myers SC (1984). The Capital Structure Puzzle. *J. Financ.*, 39(3): 575-592.
- OECD (2004). "OECD Principles of Corporate Governance." <http://www.oecd.org/dataoecd/32/18/31557724.pdf>. accessed Sep. 10, 2010.
- Shyam-Sunder L, Myers SC (1999). Testing Static Tradeoff Against Pecking Order Models of Capital Structure. *J. Financ. Econ.*, 51(2): 219-244.