國立交通大學

經營管理研究所

博 士 論 文

No.131

薪酬資訊揭露與公司價值

Compensation Disclosure and Firm Value

研 究 生：劉志良

指導教授：許和鈞 教授

中 華 民 國 九 十 九 年 六 月

國立交通大學

經營管理研究所

博 士 論 文

No.131

薪酬資訊揭露與公司價值

Compensation Disclosure and Firm Value

研 究 生：劉志良

指導教授：許和鈞 教授

研究指導委員會：許和鈞 教授

周雨田 教授

鍾惠民 教授

中 華 民 國 九 十 九 年 六 月

薪酬資訊揭露與公司價值

Compensation Disclosure and Firm Value

研 究 生：劉 志 良　　Student：Chih-Liang Liu

指導教授：許 和 鈞 博士　　Advisor：Dr. Her-Jiun Sheu

國 立 交 通 大 學
經 營 管 理 研 究 所
博 士 論 文

A Dissertation
Submitted to Institute of Business and Management
College of Management
National Chiao Tung University
in Partial Fulfillment of the Requirements
for the Degree of
Doctor of Philosophy
in
Management

June 2010

Taipei, Taiwan, Republic of China

中華民國九十九年六月

薪酬資訊揭露與公司價值

研究生：劉志良　　指導教授：許和鈞博士

國立交通大學經營管理研究所博士班

摘　　要

本論文主要係探討董事與經理人之薪酬資訊在不同揭露透明度下的市場價值。在自我選擇的偏誤下，有較高董事獨立性的公司通常會傾向提供較完整的薪酬資訊揭露，進而降低代理問題，而臺灣的主管機關提供了一個漸進執行的薪酬資訊揭露改革政策，所以針對是否要提供較高透明度之薪酬資訊的揭露要求，主管機關提供這些公司相當大的裁量選擇空間，因此，本研究可以利用此一自然實驗下的資料獨特性，來驗證不同薪酬揭露程度對公司價值的影響效果。

第一個研究議題係探討公司自願揭露完整的董事與經理人薪酬資訊是否會帶來較高的市場價值。實證結果指出，市場針對那些自願揭露完整薪酬資訊的公司反應出較高的市場評價，然而，對於那些使用大量以權益為基礎之工具作為紅利發放的電子產業公司，其完整薪酬揭露的市場價值並不顯著，因為像這樣以權益為基礎的紅利工具，外部投資人較無法衡量其真正的市場價值，進而難以判斷這樣的薪酬架構是否會帶來代理問題。此外，透過會計基礎評價模型與自我選擇模型，以及控制公司年紀效果與時間序列效果後的迴歸分析，對於完整薪酬揭露的市場價值亦得到相同的結論。

第二個延伸主題係欲探討的是，在控制住原本完整薪酬揭露所帶來的市場價值後，其他中等透明度的自願性薪酬揭露是否會帶來額外的市場價值提升效果。驗證結果指出，雖然中等透明度的薪酬揭露相較於強制要求揭露的資訊有較高的透明度，但是像這樣仍然較不完整的揭露資訊內涵對於市場價值的提升幫助有限，然而，對於那些通常會被認為是治理機制較差的非電子產業公司而言，中等透明程度的薪酬揭露，會因為被認為多揭露了一些相對的資訊斷層，而讓中等程度的薪酬揭露產生額外較高的市場價值。綜而觀之，本研究所提出的主張係認為，只有完整的薪酬資訊揭露可以帶來較高的市場評價，而其他透明程度的薪酬資訊揭露對於公司市場價值的提升幫助有限。

關鍵詞：薪酬資訊、完整揭露、代理問題、董事獨立性、自我選擇偏誤。

Compensation Disclosure and Firm Value

Student: Chih-Liang Liu Advisor: Dr. Her-Jiun Sheu

Institute of Business and Management
National Chiao Tung University

Abstract

The dissertation is set out to explore the market value of different transparency levels of disclosure of information on compensation paid to directors and executives. Under the theory of self selection, firms with higher levels of board independence will tend to provide comprehensive disclosure of compensation, thereby leading to lower agency conflicts. Since the authorities in Taiwan adopt a policy of gradual enforcement of compensation disclosure, firms are provided with discretion with regard to any greater levels of transparency that they may choose to provide. Such unique natural experimental setting is therefore exploited to examine the effects of different levels of transparency of compensation disclosure on market value.

The first essay is to answer the question of whether firms voluntarily providing comprehensive disclosure of information on compensation paid to directors and executives have higher market values. The evidence indicates that the market provides a higher valuation to those firms which elect to voluntarily disclose comprehensive information on their compensation practices. However, the electronics firms using large proportion of stock-based bonus are not valued higher due the reason that the difficulty for valuing the stock-based bonus makes the outsiders hard to identify the agency problems. The robustness from the Ohlson model, the self-selection model and the regressions controlling firm-age and time-series effects provides the same results.

The second essay is to extend the compensation disclosure issue from previous evidence by suggesting that whether medium level of transparency on compensation disclosure provide additional market value after controlling the effects of comprehensive disclosure. The evidence finds that even where such disclosure is in excess of the minimum mandatory requirements, lower levels of transparency in the overall disclosure of compensation practices are of very little help with regard to the creation of market value. However, for the non-electronics firms generally regarded as having relatively weak governance mechanisms, the effect of medium disclosure on market value is significantly positive because of the disclosure gap. The overall evidence suggests that only comprehensive disclosure on compensation provide higher market values, whilst other levels of transparency are of little for the market value creation.

Keywords: compensation information, comprehensive disclosure, agency conflict, board independence, self-selection bias

Acknowledgement

I would like to thank my advisor, Professor Her-Jiun Sheu, for his guidance, assistance, and enormous support during my entire doctoral program. I am particularly grateful for his guidance not only in developing my research agenda, but also in leading me the right way in academic research. He is also an incredible mentor and an endless source of inspiration, helping me sail through the lows of the dissertation process with great ease. Words are inadequate to express my thanks to learn from his selfless concern, pleasant characteristics and especially his integrity as an academician.

Special thanks are given to Professor Huimin Chung for his expert guidance and giving me many thoughtful insights and comments on an earlier version of this paper, despite his tight schedules. In addition, I do appreciate his critical training and severe requirements, particularly for the ways and attitudes through which how a research paper can be published in good journals step by step. Also, I am greatly indebted for the uncountable number of hours he spent helping me improve the writing quality. He is such an academician for guiding me the way in the field of financial research.

Many thanks are given to the members of my advisory committee for providing detailed instructions and suggestions to this dissertation, including Professor Ray-Yeutien Chou**,** Professor Taychang Wang, Professor Sheng-Syan Chen, Professor Yuan-Chen Chang, Professor Robin K. Chou and Professor Wei-Peng Chen. Their comments have gone a long way in improving this dissertation and future research. I would also like to express my gratitude to Professor Fu-Ju Yang for enriching this dissertation for a great extent.

I would like to gratefully acknowledge the financial supports and grants provided by the Ministry of Education, National Science Council, National Chiao Tung University, and Professor Sheu's and Chung's laboratory. Thanks also due to Mrs. Hui-Juan Hsiao in the Ph.D. program for her patience handling the process throughout my graduate studies. Special thanks should be given to others who accompany me but not being mentioned for their friendship and kindness during my years in NCTU.

This work is dedicated to my parents for their love, care and support during my doctoral studies. Last but not least, thanks go to my wife, I-Chun Lee, for her companion and encouragement. She has also been an enormous support, and I cannot imagine getting my doctorate without her being by my side.

Table of Contents

List of Tables

1. INTRODUCTION

The main purpose of this study is to determine whether there are any discernible variations in the market value of firms with different levels of transparency relating to the voluntary disclosure of their compensation practices. It is able to take advantage of a natural and unique experimental setting in Taiwan involving a period during which the authorities with responsibility for compensation disclosure policy reforms chose to adopt an approach of gradual enforcement. Hence, firms are provided not only with disclosure guidelines and tabular forms, but also with considerable discretion as to whether they might provide higher levels of transparency through voluntary disclosure. Based on data for all listed Taiwanese firms covering the period from 1996 to 2008, our results indicate that voluntary disclosure of comprehensive information on director and executive compensation results in higher market value.

When setting executive compensation arrangements, the overall aim is to align the interests of owners and managers, thereby reducing agency problems. However, such compensation could, in itself, give rise to agency problems. One way to effectively resolve such problems is to provide full disclosure on compensation (Bebchuk and Fried, 2003; Lo, 2003; Gordon, 2005; Muslu, 2009; Morse et al., 2010). Compensation disclosure is accompanied by several benefits. The prior studies suggest that compensation disclosure and corporate governance are mutually complementary in reducing agency problems (Beekes and Brown, 2006; Coles, 2008; Henry, 2008). Laksmana (2008) finds that such disclosure can reduce information asymmetry, whilst Bushman and Smith (2001) suggest that signals of transparency provide a channel through which information disclosure affects market value. Using a survey on comment letters, Lo (2003) finds that firms initially opposed to compensation disclosure,

subsequently had higher stock returns once the disclosure policy became mandatory.

It is, however, quite clear that in their analysis of the effects of compensation disclosure, the prior studies have invariably tended to focus on mandatory disclosure of information relating to the setting of executive compensation contracts. In contrast, in the present study it explores the market value arising from the voluntary disclosure of the compensation paid to directors and executives, providing incremental contributions to the extant literature in several ways.

Firstly, when discussing voluntary disclosure, it is preferable for data to be sourced from a situation within which disclosure has a discretionary element. Although the US already has relatively severe regulations on compensation disclosure, both the nature of voluntary disclosure and the effects of different levels of transparency are difficult to examine under such a setting (Leuz and Verrecchia, 2000). In our natural experimental environment of Taiwan, firms are provided with considerable discretion in their level of transparency relating to voluntary disclosure, albeit with increasingly severe requirements. The unique data on different levels of transparency obtained by examining annual reports provides a very useful understanding of disclosure behavior, thereby extending this line of research.

The agency problems attributable to compensation arrangements can be identified by outside investors in the Taiwanese market through an examination of whether listed firms voluntarily provide comprehensive disclosure of compensation in their financial reporting. Since the policy reforms on compensation disclosure faced with significant opposition, the authorities provide discretion with regard to the level of transparency in their compensation disclosure. Directors and executives are therefore able to select disclosure preferences that are in their own interests. One approach, particularly for those who are faced with agency problems, is to camouflage the bargaining of personal rents.

However, by sending out a signal of good governance mechanisms through the comprehensive disclosure of compensation, firms will invariably achieve a higher market valuation, thereby further benefiting such directors/executives. Our evidence from the Taiwanese market contributes to the extant literature by addressing the importance of transparency of compensation arrangements on good governance mechanisms.

Secondly, it is suggested that it is only comprehensive disclosure which makes any significant contribution to firm value, with other levels of transparency being found to be of little help to the creation of additional market value. The unique data on compensation disclosure, hand-collected from financial reporting in Taiwan, are categorized as 'comprehensive' or 'non-comprehensive' disclosure. The evidence reveals that comprehensive disclosure provides a signal of better governance mechanisms and fewer agency conflicts, thereby leading to higher firm value. In the additional extensions, non-comprehensive disclosure is further decomposed into 'medium' or 'minimal' disclosure, with the result that after controlling for comprehensive disclosure, medium disclosure is found to be of little help to the creation of higher market value.

Thirdly, our paper contributes to the extant literature by indicating the positive market value arising from voluntary disclosure of comprehensive information on compensation. The prior studies have explored the market value of the overall quality of information disclosure and/or levels of transparency in annual reporting. However, despite several studies have gone on to investigate the relationship between compensation disclosure and other factors affecting firm value, such as information asymmetry or abnormal returns, the market value of compensation disclosure has seldom been explored. In light of the current trend towards the increasing demand for transparency in compensation awards, our paper is the first to provide evidence on the market value of voluntary disclosure of compensation, with particular focus on the

comprehensive nature of such information.

Fourthly, it provides evidence of the market value of disclosure not only on executive compensation, but also on director compensation, an issue which has seldom been explored. Since the compensation contract provides an indirect way for shareholders to discipline management, the limits of the optimal contract suggest that those compensation contracts which aim to resolve agency problems actually represent a contributory element of the agency conflict itself (Core et al., 1999; Bebchuk and Fried, 2003; Muslu, 2009; Morse et al., 2010). As noted by Brick et al. (2006), the problem of mutual favors going on between directors and executives is exacerbated if compensation arrangements are camouflaged. One way of resolving such interlocking relationships is to require both parties to disclose their compensation arrangements.

The remainder of this paper is organized as follows. Compensation disclosure policy reforms in Taiwan are discussed in Section 2, with particular focus on the regulatory changes. Section 3 provides a discussion on the theories within the extant literature and our hypothesis development, with Section 4 presenting our empirical results. Finally, the conclusions drawn from this study are presented in Section 5.

2. COMPENSATION DISCLOSURE POLICY REFORMS

The policy reforms on the disclosure of compensation have been undertaken in many countries around the world (see Appendix, Table A1). Several countries with well developed governance mechanisms provide strict regulations on the disclosure of information on director and executive compensation (US and Canada). However, most of the countries are trying to provide more severe compensation disclosure requirements, particularly for those capital markets being faced with potential oppositions on compensation disclosure regulations (Australia, Malaysia, India, Hong Kong, UK, New Zealand, South Korea and Russia). In addition to countries with developed systems, many countries provide limited regulations and are attempting to build up appropriate legal systems (China, Philippines, Thailand, Indonesia and Mexico). There are even several countries not providing any compensation disclosure requirements. Our examination is particularly relevant to those capital markets where disclosure regulations are currently undergoing reform.

The authorities in many countries now find themselves faced with considerable opposition as a result of the immediate enforcement of regulations (such as, the 1992 SEC reforms on compensation disclosure). Such mandatory enforcement may be attributable to the excessive, and often invisible, burdens placed on firms, particularly for those with non-optimal compensation arrangements. It has become generally recognized that disclosure of information on compensation paid to directors and executives satisfies the needs of outsiders with regard to the assessment of the governance mechanisms in place within a firm. Directors and managers who are faced with agency conflict may tend to camouflage their bargaining rents and mutual favors, whilst the authorities currently stand in juxtapose positions.

Table 1 Gradual Enforcement of Compensation Disclosure Policy Reforms

Year	Additional Requirement for Mandatory Disclosure	Additional Requirement for Voluntary Disclosure	Additional Disclosure Requirement not Quantified in our Analyses
1995	Mandatory disclosure of lump sum compensation paid to all directors and executives in the *Statement of Changes in Stockholders' Equity.*	Disclosure of total remuneration, cash awards, special allowances, number of share warrants, bonuses and other personal expenditure paid to CEO, directors, managing directors, supervisors and other executives	Discussion on compensation policies and their association with performance in the *Additional Disclosure Notes.*
2002	Mandatory disclosure of names, position and duration held by CEO or managers in charge of finance or accounting who also hold positions within the accounting firm or any of its affiliated enterprises.	–	–
2003	–	–	Discussion on the effects of proposed compensation on earnings per share, including the amount of compensation proposed at the board meetings, the actual distribution of such compensation, and the degree of discrepancy between the two.
2006	Mandatory disclosure of total number of directors and executives in *Table L.*	1. Disclosure of names of directors and executives in *Table L* and the remuneration from other invested companies and/or subsidiaries in *Table D*. 2. To specify whether the remuneration payment is from fixed remuneration or business entitlement. 3. To specify whether all kinds of compensation being paid are from the positioned (stand-alone) company or from other invested companies and/or subsidiaries.	Discussion on remuneration policies, standards, packages, procedures for setting remuneration, linkage to performance and total remuneration of directors, general managers and assistant general managers paid by the company and all other companies in the consolidated financial statements

2007	1. Mandatory disclosure of names of directors and executives in *Table L*, and compensation paid to independent directors in *Table D*. 2. To expand *Table L* from five to eight levels.	1. Disclosure of remuneration, bonuses and allowances paid to employed managing directors in *Table D*. 2. To specify whether other payments are from other invested companies or subsidiaries	–
2008	Disclosure of each item of lump sum compensation paid to directors and executives in *Table D*.	Disclosure of amount of pension paid to each director, supervisor, CEO and other executives in *Table D*.	–

Notes:

[a] *Table L* refers to the table on *Levels of Directors*' (*Executives*') *Compensation*; *Table D* refers to the table on *Detailed Information on Directors*' (*Executives*') *Compensation* (see Appendix Table A2, Panel A and B).

[b] The definitions of the different transparency levels of compensation disclosure in our research design are mainly dependent upon the disclosure tables, essentially because other narrative information on compensation is difficult to quantify. This gradual enforcement approach encompasses both mandatory and voluntary compensation disclosure. Within each regulatory change, the authorities provide firms with the tabular forms and the discretion to choose, or to choose not, to provide additional voluntary disclosure in excess of the mandatory requirements in certain areas. There are, however, mandatory requirements for firms to comply with the regulations by providing disclosure of compensation information in other areas, once these regulations are revised. Not only does the gradually increasing severity of the regulations provide a flexible means of achieving the final goal of comprehensive disclosure with a lower burden on firms along the way, but such an approach can also satisfy cultural preferences in many of the emerging markets.

In contrast to the disclosure reforms featuring mandatory enforcement, the Financial Supervisory Commission in Taiwan adopted a gradual approach to the enforcement of its policy reforms. It simultaneously takes into account both current opposition pressure and final mandatory enforcement of the rules in the future, and thereby providing some potential resolution of the problems associated with immediate mandatory enforcement (Table 1).

The compensation disclosure policy reforms in Taiwan can be decomposed into three-stage gradual enforcements. Within each stage of the gradual process of enforcement of the mandatory disclosure, firms are required to comply with the regulations by disclosing the necessary information once these regulations have been revised. Conversely, voluntary disclosure provides discretion for firms to voluntarily disclose additional information, in excess of the mandatory disclosure requirements, in the tabular forms proposed by the authority.

The first stage of this gradual enforcement process, from 1996 to 2008, provides a natural experimental setting for our analysis. The information to be mandatorily disclosed during this first stage includes the following: (i) information on the compensation policies and their association with performance; (ii) the financial statement records of all lump sum compensation paid to directors and executives; and (iii) the total number of directors and executives, under eight compensation levels, in the form of the table entitled *Levels of Directors*' (*Executives*') *Compensation* (*Table L*; see Appendix, Table A2, Panel B). Firms were also provided with discretion with regard to the additional voluntary disclosure, in excess of the mandatory requirements, such as the names of directors and executives under eight compensation levels, or additional details in the form of the table entitled *Detailed Information on Directors*' (*Executives*') *Compensation* (*Table D*; see Appendix, Table A2, Panel A). The

incremental requirements of mandatory disclosure in the second stage address the names of the directors and executives under each compensation level and the detailed elements in the Table D. The requirements in the third (future) stage will aim at enforcing compliance with regard to all details on compensation information to be disclosed in the form of the tables proposed by the authority.

There have been mandatory requirements in place in Taiwan for the disclosure of information on compensation ever since 1995, along with numerous other voluntary options. The 2002, 2006, 2007 and 2008 amendments to the regulations required mandatory disclosure of additional items in the Table D and the Table L. These amendments also provide firms with revised tabular forms and guidelines for voluntary disclosure, but more importantly, with discretion as to whether or not they will elect to voluntarily provide additional information in excess of the mandatory requirements.

As an example, a managing director serves not only as the CEO and director for company A, but also as a director for other corporations or related businesses. One of the concerns in such situations is that the managing director receives different amounts of compensation for his work as an executive and director within company A, and for services provided to the other companies. A phenomenon whereby the managing director receives more compensation from the other companies than from company A raises a significant agency conflict relating to whether he places sufficient resources into disciplining management and making critical decisions in his main role. With discretion on comprehensive disclosure and his preferred level of transparency, the managing director is likely to disclose less information on his overall level of compensation.

Another concern is that the incentive mechanisms within the managing director's compensation contract may include more short-term measures, such as cash dividends, as opposed to long-term measures, such as stock dividends and share warrants.

Investors may therefore question whether beneficial long-term investment is likely to be replaced with short-term, risk-bearing investment. The compensation transparency level signals whether and how he contributes to company A. As a result, outside investors can identify agency problems through the voluntary disclosure, further reflecting the perceived signal of the level of disclosure in the firm's market value.

3. HYPOTHESES DEVELOPMENT AND RESEARCH DESIGN

3.1 Compensation Disclosure and Corporate Governance

Information disclosure represents an external market-based monitoring mechanism which compensates for the failure of board functions (Mallin, 2002; Parum, 2005; Henry, 2008), whilst Healy and Palepu (2001) note that the primary purpose of disclosure is to communicate performance and governance to investors. Thus, any regulations created to facilitate credible disclosure are essentially aimed at reducing information asymmetry (Leftwich, 1980; Holland, 1998; Perotti and Von Thadden, 2003; Bushee and Leuz, 2005). Nevertheless, Chen et al. (2004) argue that mandatory disclosure is insufficient to render such a mechanism effective, since the inside information available to directors and executives will always be superior to that available to outsiders. Therefore, voluntary disclosure, which refers to any information which is disclosed in excess of the requirements of mandatory compliance, provides an additional governance mechanism (Core, 2001; Healy and Palepu, 2001).

Compensation disclosure is generally hailed as a remedy for the agency problems created by inappropriate compensation contracts, providing several channels through which it can help to improve governance mechanisms. Firstly, voluntary disclosure on compensation provides a window, both on the board and on the overall quality of governance (Laksmana, 2008; Karamanou and Nishiotis, 2009), whilst also presenting directors and executives with the non-pecuniary costs of external pressure. Thus, firms with good governance structures are more likely to voluntarily provide higher levels of transparency relating to their compensation practices (Jensen and Murphy, 1990; Murphy, 1996; Perotti and Von Thadden, 2003; Gordon, 2005; Beekes and Brown, 2006; Coles, 2008).

Secondly, the camouflaging of compensation can be reduced when such allocations are publicized; in such cases, compensation arrangements are ultimately shaped by market forces (Diekmann, 1997; Bebchuk and Fried, 2003; Muslu, 2009; Morse et al., 2010). The limits of the optimal compensation contract as argued by Bebchuk and Fried (2003) raise another concern that whether the directors will be responsible for their duties to monitor and discipline the management. Some directors who are under consideration for re-nomination to the board in the subsequent year, and particularly those who are keen to bargain at arm's length, will attempt to provide the executives with certain benefits. This 'mutual favor' effect, examined by Brick et al. (2006), provides evidence on the limit of optimal compensation. Such agency conflict will therefore be exacerbated if both directors and executives camouflage both their derived excessive power and their subsequent bargaining behavior. Scandals involving directors and executives being paid extremely high levels of compensation highlight the fact that compensation contracts could involve inappropriate incentives. Given that the directors find themselves placed in a position which involves contracting between managers and shareholders, self-serving behavior is likely to be higher in those cases within which the propensity for mutual favors is found to exist (Healy and Palepu, 2003; Brick et al., 2006; Karamanou and Nishiotis, 2009).

Thirdly, through appropriate compensation disclosure, shareholders can readily see that the arrangements in place for executive compensation are aligned with their own interests (Ward, 1998; Zhou, 1999; Craighead et al., 2000; Gordon, 2005; Muslu, 2009); furthermore, such disclosure can also strengthen the power of directors over managerial power (Conyon, 2001; Andjelkovic et al., 2002; Van den Berghe and Levrau, 2004; Laksmana, 2008). Despite the fact that executive compensation is decided by the board, executives still have at least some partial influence on the level,

or the content, of the compensation contract that is finally agreed (Murphy, 1999). Thus, the strengthening of board independence through compensation disclosure helps to alleviate such interlocking relationships between directors and executives (Hallock, 1997; Bebchuk and Fried, 2003; Gordon, 2005).

Fourthly, voluntary disclosure on compensation levels provides a signal to outsiders, thereby satisfying their needs to observe the governance and accountability of the firm. Since unreasonable compensation arrangements, as perceived by outsiders, can lead to outrage, firms may voluntarily adopt greater transparency of information on compensation in order to distinguish themselves from other firms (Jensen and Murphy, 1990; Conyon and Sadler, 2001). Shareholders can also be protected by using such information to identify whether the directors/executives are placing appropriate effort into monitoring those managers who may be pursuing their own personal interests (Ward, 1998; Conyon, 2001).

As compared to mandatory disclosure, voluntary disclosure provides a signal of greater transparency and other additional benefits (Holland, 1998; Karamanou and Nishiotis, 2009), such as higher trading liquidity, improvement in minority shareholder protection and strengthening of company credibility. Korn and Schiller (2003) suggest that equity prices change in opposite directions for voluntary-disclosing and non-disclosing firms. Frantz and Instefjord (2006) also indicate that lack of voluntary disclosure of information endowed with productive value may lead to negative stock returns. Therefore, our research hypothesis is particularly grounded in the criterion of voluntary disclosure, as opposed to the differences between mandatory disclosure and non-compliance. Based upon the unique dataset adopted for this study, our main purpose is to answer the question of whether voluntary disclosure of compensation paid to directors and executives, are associated with the incentive of market value

creation.

3.2 The Effects of Comprehensive Disclosure

Voluntary disclosure of compensation provides information which can reduce both the costs of capital and information asymmetry by altering the perceptions of investors with regard to the transparency of the firm (Elliott and Jacobson, 1994; Holland, 1998; Leuz and Verrecchia, 2000; Gelb and Zarowin, 2002; Laksmana, 2008). Van den Berghe and Levrau (2004) argue that shareholders can be protected by disclosure since it helps to identify whether rewards are provided on the basis of pay-for-performance, and can also determine whether the benefits of such contracts are in the best interests of shareholders. Andjelkovic et al. (2002) suggest that the association between compensation and performance is significantly positive only for firms voluntarily disclosing executive compensation. Such an association is essentially due to the benefit of long-term viability of the firm arising from such disclosure (Aksu and Kosedag, 2006). The perceptions of outsiders therefore represent an additional monitoring mechanism, with relevant disclosure being further reflected in firm value.

Amongst various levels of transparency, comprehensive disclosure is the most effective mechanism for improving governance mechanisms. Although any voluntary disclosure of compensation can be more informative to investors, just how informative such disclosure is will be largely dependent upon the level of transparency. Barry and Brown (1986) argue that if disclosure is non-comprehensive, then investors will be faced with non-diversified risks, whilst Hill (1997) points out that the basic principle behind disclosure is to ensure that the information is comprehensive. Muslu (2009) and Morse et al. (2010) note that a reduction in outrage can be achieved by the camouflaging of rent seeking activities, and that such effects are more severe when compensation disclosure is

not comprehensive. Comprehensive information is, therefore, what outsiders actually wish to acquire from voluntary disclosure (Korn and Schiller, 2003).

Although several studies suggest various channels through which market value may be affected by compensation disclosure, the direct relationship between compensation disclosure and firm value has seldom been explored. One very recent example is Morse et al. (2010), who suggest that the comprehensive disclosure of compensation provides an effective solution to the rigging of incentive contracts, which can significantly reduce firm value. Based upon the needs of all parties involved, including the authorities, outsiders, pressure from the public media and from the market, firms voluntarily disclosing comprehensive information on compensation will minimize the bonding costs between shareholders and their agents, as well as the costs of capital, price volatility, poorer transparency signals and information asymmetry (Holland, 1998; Sengupta, 1998; Noe, 1999; Lang and Lundholm, 2000; Richardson and Welker, 2001; Botosan and Plumlee, 2002; Korn and Schiller, 2003; Chen et al., 2004; Laksmana, 2008; Henry, 2008; Karamanou and Nishiotis, 2009). These reduced costs potentially lead to further increases in the market value of the firm (Makhija and Patton, 2004; Durnev and Kim, 2005). Using the data on gradual enforcement, in which the authorities provide firms with discretion to choose their disclosure transparency level, our study complements this line of research by hypothesizing that market value can be created for a firm through the voluntary disclosure of comprehensive information on compensation.

Hypothesis 1: *Firms providing voluntary comprehensive disclosure of information on the compensation paid to directors and/or executives have a higher market value, as compared to those with non-comprehensive disclosure*

3.3 Data

The data on compensation disclosure are hand-collected from the firms' annual reports and then labeled as either 'comprehensive' or 'non-comprehensive' disclosure. The definitions of the different transparency levels of compensation disclosure in our research design are mainly dependent upon the disclosure tables referred to in the *Additional Disclosure Notes*, essentially because other narrative information on compensation is difficult to quantify. The term 'comprehensive disclosure' indicates that the firms are following the authorities' most recent amendments to the requirements for both mandatory and voluntary disclosure to provide full information on compensation for each director and/or executive (second and third columns of Table 1). Conversely, 'Non-comprehensive disclosure' indicates that the firms are providing a level of transparency relating to compensation information which falls short of comprehensive disclosure.

The data used in our study records the actual behavior of voluntary disclosure of compensation recorded from the annual report. Although the comment letters on the SEC proposal for compensation-disclosure reforms, which are used by Lo (2003) as the proxy of disclosure on compensation, provide the information on psychological intension, such mental preferences may not be realized due to several internal and/or external political influences. For example, the camouflage of compensation information would be likely to be criticized both by outside market forces that push toward higher-transparency outcome, and by inside governance mechanisms that lead to the direction favorable to shareholder. Therefore, our data reflects the governance mechanism toward the regulation particularly in the sample that the authorities provide discretions for firms to follow.

One of the main distinctions between the comment letter used by Lo (2003) and

the voluntary disclosure hand-collected from the annual report is that the former is an ex ante disclosure decisions intended by a firm before the requirements become mandatory, whilst the latter is the ex post realized behavior of voluntariness adopted by a firm after the discretionary of voluntary disclosure is provided (Leuz and Verrecchia, 2000). Since the comment letter is insufficient for the validity to measure what it is purported to actually measure for the voluntary behavior, the market value association of voluntary disclosure of compensation under situations of discretionary regulations should be stronger than the association of lobbying opinions under situations of the mandatory requirement (Leuz and Verrecchia, 2003).

The actual result of disclosure is affected by the governance environments and the decision voluntary disclosure. The reaction of behavior caused by cognitive dissonance could be systematically explained by the preferences over their state of belief and the given new information (Akerlof, and Dickens, 1982). The divergent information on market pressure and the potential outrage gathered by management is filtered (selected) for reevaluating future decision making (Fox, 1999), such as the choice of transparency on compensation disclosure. Such change of surrounding environments may be sufficient to result in a change of the directors' and executives' unstable state of attitude and a revision of disclosure behavior in new directions (Hosseini, 1997; Cohan, 2002; Balata and Breton, 2005). Indeed, such changes help capture the conflicts between the self-interest of camouflage of compensation information and the independence for providing greater transparency.

The 'disclosure decision' and 'disclosure result' may not be equivalent. The facts that the comment letter is the 'disposition of a tendency to respond', and that the compensation disclosure is the 'behavior of action' (Blalock, 1964) may lead to a problem that previous mental thoughts of disclosure decision cause asymmetric effects

on the later behavioral result of disclosure. Such asymmetric causal relationship could be attributed to cognitive dissonances that when the disclosure decision clashes with the political influences and outside pressures, the 'distressing mental state' enforces the directors and executives to change their behavior results (Ade-Ajayi, 2004). This study therefore uses the results of compensation disclosure as the reasonable measure of voluntary disclosure on compensation.

Although no changes to the stage of regulations were announced during some of the years under examination in the present study, the evidence contained within the dataset does provide different financial implications based upon periods both with and without regulatory changes. On the one hand, the data relating to those periods when no regulatory changes were announced can appropriately capture the overall phenomenon of voluntary disclosure, since during such periods, the firms were still provided with tables for use in providing information on comprehensive disclosure and considerable discretion with regard to the level of voluntary disclosure that they chose to adopt. It is therefore argued that firms with better governance mechanisms would continue to disclose comprehensive information on compensation.

On the other hand, with the increasing severity of compensation disclosure requirements, the question of whether firms will change their disclosure decisions on the level of transparency can be answered quite effectively by the data relating to periods when regulatory changes were announced. Once the regulations encompass more severe voluntary disclosure items, or once some of the voluntary disclosure requirements become mandatory, those firms with severe agency conflicts will be burdened with the higher costs of the disclosure of additional information on compensation. The greater the amount of information disclosed, the higher the level of transparency relating to the extent to which directors and/or executives are faced with agency problems. The firms

would therefore be likely to change their disclosure decisions to provide information in excess of the mandatory requirement, although still below the newly-specified voluntary level, in order to camouflage the full details of their compensation practices.

Since firms listed on public exchanges have a greater propensity for voluntary disclosure (Collett and Hrasky, 2005), our sample selection considers only those firms listed on the Taiwan Stock Exchange. Following the exclusion of financial institutions, the 1996-2008 data ultimately yields a sample of 6,784 firm-year observations. It goes on to further quantify the various levels of transparency in compensation disclosure for this sample of observations as our index variables (Table 2).

In accordance with Article 196 of the Company Act, directors are defined as all board members, including standing directors, inside directors, independent (non-executive/supervisory/outside) directors and managing directors. A managing director is responsible not only for his work as a director, but also for his role in executive administration. Therefore, the compensation received for his directorship and that received for his executive administration will both be paid to him in his role as the managing director. If the firm intends to voluntarily disclose comprehensive information on managing director compensation, such information should be revealed in the tables contained in both the *Detailed Information on Executives' Compensation* and the *Employed Directors' Remuneration* section in the *Detailed Information on Directors' Compensation* (see Appendix, Table A3).

Table 2 Definitions of Compensation Disclosures

Disclosure of	Comprehensive	Non-comprehensive	
		Medium	Minimal
Compensation paid to executives and the compensation paid to the directors	*CP*	*MD*	*MN*
Director compensation only	*DCP*	*DMD*	*DMN*
Executive compensation only	*ECP*	*EMD*	*EMN*

Notes:

[a] The term 'comprehensive disclosure' indicates that the firms are following the authorities' most recent amendments to the requirements for both mandatory and voluntary disclosure to provide full information on compensation for each director and/or executive (second and third columns of Table 1). Conversely, 'Non-comprehensive disclosure' indicates that the firms are providing a level of transparency relating to compensation information which falls short of comprehensive disclosure. The data on non-comprehensive disclosure is further decomposed into 'medium' or 'minimal' disclosure. The term 'minimal disclosure' indicates that firms comply only with the mandatory requirements for disclosure of information on compensation in their annual reports (second column of Table 1). Therefore, any additional requirement for mandatory disclosure during the regulatory changes in the subsequent years is included within our measurement of minimal disclosure. However, the regulatory changes on voluntary disclosure are not adopted by minimal disclosure firms (see Appendix, Table A3). 'Medium disclosure' indicates that by adopting the regulatory changes, the firms are providing compensation information on all of the mandatory requirements whilst also complying with some elements of voluntary disclosure, where such level of transparency is in excess of the mandatory disclosure, but falls short of comprehensive disclosure (see Appendix, Table A3).

[b] In accordance with Article 196 of the Company Act, directors are defined as all board members, including standing directors, inside directors, independent (non-executive/ supervisory/outside) directors and managing directors.

If a firm voluntarily provides 'comprehensive disclosure' not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0; therefore, when *CP* is 0, this indicates a setting of non-comprehensive disclosure. If a firm discloses comprehensive information only on executive compensation, then *ECP* takes the value of 1, otherwise 0. Similarly, if a firm discloses comprehensive information only on director compensation, then *DCP* takes the value of 1, otherwise 0. For example, if a firm provides comprehensive information only on the compensation paid to directors then *DCP* = 1; *ECP* = 0; *CP* = 0. As regards the measurement of comprehensive disclosure, *DCP* and *ECP* are subsets of *CP*; that is to say *CP* = 1 only if *DCP* and *ECP* are simultaneously equal to 1.

Although comprehensive disclosure is still not mandatory in Taiwan, those firms with better governance mechanisms generally tend to provide comprehensive disclosure of information on compensation. The proportion of firms in Taiwan providing comprehensive disclosure is defined as the number of firms providing comprehensive disclosure divided by the total number of all listed firms. As revealed by Table 3, there have been continuing increases in the total number of all listed firms. However, the number of firms providing comprehensive disclosure remained almost the same during the sample period. Thus, there have been significant reductions in the relative proportion of firms providing comprehensive disclosure, from 59.54 per cent in 1996 to just 15.82 per cent in 2008.

Table 3 Compensation Disclosure Practices under Various Transparency Levels

Year	Comprehensive (*CP*)	Non-comprehensive	Medium (*MD*)	Minimal (*MN*)	No. of Available Listed Firms
1996	59.54	40.46	28.63	11.83	262
1997	58.96	41.05	29.48	11.57	268
1998	56.48	43.52	34.55	8.97	301
1999	53.10	46.90	41.00	5.90	339
2000	44.89	55.10	52.49	2.61	420
2001	35.08	64.92	62.21	2.71	516
2002	30.68	69.32	66.20	3.12	577
2003	26.65	73.35	69.82	3.53	622
2004	25.08	74.93	71.50	3.43	642
2005	23.96	76.04	72.35	3.69	651
2006	15.58	84.42	82.45	1.97	661
2007	15.78	84.22	83.00	1.22	735
2008	15.82	84.18	83.29	0.89	790

Notes:

[a] The term 'comprehensive disclosure' (*CP*) indicates that the firms are following the authorities' most recent amendments to the requirements for both mandatory and voluntary disclosure to provide full information on compensation for each director and/or executive (second and third columns of Table 1). Conversely, 'Non-comprehensive disclosure' indicates that the firms are providing a level of transparency relating to compensation information which falls short of comprehensive disclosure. The data on non-comprehensive disclosure is further decomposed into 'medium' or 'minimal' disclosure. The term 'minimal disclosure' (*MN*) indicates that firms comply only with the mandatory requirements for disclosure of information on compensation in their annual reports (second column of Table 1). Therefore, any additional requirement for mandatory disclosure during the regulatory changes in the subsequent years is included within our measurement of minimal disclosure. However, the regulatory changes on voluntary disclosure are not adopted by minimal disclosure firms (see Appendix, Table A3). 'Medium disclosure' (*MD*) indicates that by adopting the regulatory changes, the firms are providing compensation information on all of the mandatory requirements whilst also complying with some elements of voluntary disclosure, where such level of transparency is in excess of the mandatory disclosure, but falls short of comprehensive disclosure (see Appendix, Table A3).

[b] The numbers provided refer to the proportion (%) of firms disclosing different levels of transparency on compensation information to the total sample number for that year.

4. EMPIRICAL ANALYSES

4.1 Regression Analyses

To facilitate our analysis of the effects of comprehensive disclosure of director/executive compensation, the regression models is adopted by using several firm characteristics and profitability control variables. The variables used in this study are obtained from the Taiwan Economic Journal database, with the descriptive summaries and the correlation coefficients being provided in Table 4.

The signals of good governance that are provided by comprehensive disclosure, along with the resultant effects, such as the reduced costs of capital and information asymmetry, are readily perceived by investors. It is therefore expected to find that those firms providing comprehensive disclosure of information on compensation will have a higher market value, as compared to those firms with non-comprehensive disclosure levels. It begins by adopting an OLS regression to examine the association between comprehensive disclosure and firm value:

$$\begin{aligned} Q_i = \alpha \ &+ \delta\, CP_i + \beta_1 SIZE_i + \beta_2 DEBT_i \\ &+ \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i \end{aligned} \tag{1}$$

where firm value (Q) is measured by Tobin's Q, which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets; and CP refers to the comprehensive disclosure of information on the compensation paid to directors and executives.

Table 4 Descriptive Summary and Correlation Coefficient Matrix [a]

Panel A Descriptive Summaries

	Mean	S.D.	Min.	Med.	Max.
Q	1.510	0.730	0.012	1.575	18.877
CP	0.419	0.493	0.000	0.000	1.000
DCP	0.354	0.478	0.000	0.000	1.000
ECP	0.361	0.480	0.000	0.000	1.000
SIZE	15.592	1.314	10.500	15.394	20.594
DEBT	43.910	17.428	1.096	44.969	98.715
INVST	27.950	16.754	0.000	24.100	99.540
FCF	7.930	4.093	−6.615	7.289	94.782
ROA	2.340	5.082	−100.720	4.750	50.640
EPS	1.172	2.513	−18.240	1.002	57.850

Panel B Correlation Coefficient

	Q	*CP*	*DCP*	*ECP*	*SIZE*	*DEBT*	*INVST*	*FCF*	*ROA*
Q									
CP	0.010								
DCP	0.010	0.960***							
ECP	0.010	0.920***	0.880***						
SIZE	0.090***	0.090***	0.070***	0.090***					
DEBT	−0.920***	0.002	0.001	0.030	0.250***				
INVST	0.900***	0.010	0.010	−0.010	0.040***	−0.920			
FCF	0.001	0.020	0.020	0.020	0.020	−0.020	0.001***		
ROA	0.001	0.010	0.010	0.010	−0.050***	−0.010	0.002	0.004	
EPS	−0.010	0.020	0.010	0.010	−0.020	−0.020	−0.010	0.610***	0.590***

Notes:

[a] Firm value (*Q*) is the Tobin's *Q*, which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets. If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. If the firm discloses comprehensive information only on executive compensation, then *ECP* takes the value of 1, otherwise 0. Similarly, if the firm discloses comprehensive information only on director compensation, then *DCP* takes the value of 1, otherwise 0. The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*). Mean is the value of mean average; S.D. is the value of standard deviation; Min. is the value of minimum; Med. is the value of medium; Max. is the value of maximum.

[b] *** indicates significance at the 1% level.

The control variables come under the two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. Following Healy et al. (1999), the control variables for profitability include return on assets (*ROA*) and earnings per share (*EPS*). ε is the error term; and α, δ and β are the parameters to be estimated.

The coefficient of *Q* on *CP* in Model I of Table 5 is significantly positive, thereby providing support for Hypothesis 1, which posits that firms providing voluntary disclosure of comprehensive information on director and executive compensation will have a higher market value. The economic significance of this is provided by the coefficient of 0.016 on comprehensive disclosure in Model I, which indicates that, *ceteris paribus*, if a firm voluntarily provides comprehensive disclosure on the compensation paid to directors and/or executives, then this implies a market value enhancement of 1.6 percentage points. Firms may, however, elect to disclose comprehensive information on either director or executive compensation, but not both. It therefore uses alternative variables to examine the effect of comprehensive disclosure on the compensation paid to directors (*DCP*) or executives (*ECP*), re-running regression (1) by replacing *CP* with *DCP* and *ECP* as following.

$$Q_i = \alpha + \delta\ DCP_i + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i \quad (2)$$

$$Q_i = \alpha + \delta\ ECP_i + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i \quad (3)$$

Table 5 The Effects of Comprehensive Compensation Disclosure on Firm Value with OLS Model

This table presents the estimated coefficients from the following regression models.

Model I: $Q_i = \alpha_1 + \delta^1 CP_i + \beta_1^1 SIZE_i + \beta_2^1 DEBT_i + \beta_3^1 INVST_i + \beta_4^1 FCF_i + \beta_5^1 ROA_i + \beta_6^1 EPS_i + \varepsilon_i^1$

Model II: $Q_i = \alpha_2 + \delta^2 DCP_i + \beta_1^2 SIZE_i + \beta_2^2 DEBT_i + \beta_3^2 INVST_i + \beta_4^2 FCF_i + \beta_5^2 ROA_i + \beta_6^2 EPS_i + \varepsilon_i^2$

Model III: $Q_i = \alpha_3 + \delta^3 ECP_i + \beta_1^3 SIZE_i + \beta_2^3 DEBT_i + \beta_3^3 INVST_i + \beta_4^3 FCF_i + \beta_5^3 ROA_i + \beta_6^3 EPS_i + \varepsilon_i^3$

	Model I		Model II		Model III	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.016	4.26***	–	–	–	–
DCP	–	–	0.014	2.99***	–	–
ECP	–	–	–	–	0.013	4.83***
SIZE	–0.016	–8.13***	–0.016	–8.10***	–0.016	–8.06***
DEBT	–0.010	–71.79***	–0.010	–71.75***	–0.010	–71.80***
INVST	0.001	3.26***	0.001	3.27***	0.001	3.20***
FCF	0.0001	0.42	0.0001	0.43	0.0001	0.42
ROA	0.002	2.81***	0.002	2.82***	0.001	2.77***
EPS	0.062	0.40	0.046	0.40	0.060	0.39
BV	–	–	–	–	–	–
AER[a]	–	–	–	–	–	–
Constant	0.255	8.89***	0.254	8.86***	0.253	8.82***
Adj. R^2	0.427		0.427		0.427	
MSE	0.202		0.202		0.202	
No. of obs.	6,784		6,784		6,784	

Notes:

[a] The dependent variable in Models I, II, and III is the Tobin's *Q* (*Q*), which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets. If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. If the firm discloses comprehensive information only on executive compensation, then *ECP* takes the value of 1, otherwise 0. Similarly, if the firm discloses comprehensive information only on director compensation, then *DCP* takes the value of 1, otherwise 0. The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Significantly positive effects are discernible in Table 5 for *DCP* in Model II and *ECP* in Model III, thereby providing support for Hypothesis 1. The relatively higher rejection power for *ECP*, as compared to *DCP*, suggests that outsiders are more concerned with self-serving behavior amongst executives, although it may well be that directors are also faced with agency conflicts. Such concerns of transparency on executive compensation are more significantly reflected in the value of the firm. However, comprehensive disclosure on executive compensation also provides information on the future development of business strategies. Therefore, those firms that find themselves burdened with higher intrinsic costs relating to information on executive compensation are also likely to simultaneously disclose comprehensive information on compensation awarded to directors once they have already taken the decision to provide comprehensive disclosure on the compensation awarded to their executives, thereby leading to similar effects for both *CP* and *ECP*.

Throughout any policy reform periods, regardless of whether or not such periods involve any regulatory changes, comprehensive disclosure provides signals of better governance mechanisms. Thus, during periods when there are no regulatory changes, firms still have to decide whether to continue to voluntarily provide comprehensive disclosure. Furthermore, when more severe regulatory requirements on mandatory and voluntary disclosure are imposed by the authorities, firms are again faced with critical disclosure decisions as to whether they should follow the latest requirement to provide additional information on compensation in their subsequent annual reports. The evidence suggests that throughout the policy reform period in Taiwan, those firms providing comprehensive disclosure of compensation have a higher market value.

4.2 Accounting-based Valuation Model

The Ohlson accounting-based valuation model can reflect other information relating to the equity market value which goes beyond information on issues such as earnings, book value or dividends as provided in their annual reports (Ohlson, 1995). This model has been adopted in prior studies as the means of determining whether disclosure transparency can enhance the effects of accounting information on firm value (Cahan, et al., 2000; Strong, 2000; Lundholm and Myers, 2002; Chen et al., 2002; Lapointe-Antunes et al., 2006).

In this study, the index of voluntary disclosure of compensation, taken from the *Additional Disclosure Notes*, is seen as financial information of relevance to market value. The Ohlson model is specified under the following regression:

$$MV_i = \alpha_0 + \alpha_1 \cdot BV_i + \alpha_2 AER_i^a + \alpha_3 v_i + \varepsilon_i \quad (4)$$

where MV_i is the market value of equity for firm i at the last annual report announcement date (four months after the end of a fiscal year); BV_i is the book value of equity; abnormal earnings (AER_i^a) is provided by $AER_i^a \equiv Earnings_i - r_f \cdot BV_i$, where r_f is the one-period risk-free rate of return; and v refers to other information relevant to market value which addresses the comprehensive disclosure of information on compensation (*CP*). With the one exception of *CP*, all of the other variables within the model are deflated by multiple deflators, including sales and number of shares outstanding (Aboody, 1996; Rees, 1997; Barth et al., 1998; Chen, 2003; Akbar and Stark, 2003). The results on *CP* (Table 6) find that after controlling for the book value of equity and earnings, firms voluntarily disclosing comprehensive information on compensation have a higher value.

Table 6 The Effects of Comprehensive Compensation Disclosure on Firm Value with Ohlson Model

This table presents the estimated coefficients from the following regression models.

Model I: $$\frac{MV_i}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)}=\alpha_0+\alpha_1\frac{BV_i}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)}+\alpha_2\frac{AER_i^a}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)}+\alpha_3 v_i+\varepsilon_i$$

Model II: $$\frac{MV_i}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)}=\alpha_0+\alpha_1\frac{BV_i}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)}+\alpha_2\frac{AER_i^a}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)}+\alpha_3 v_i+\varepsilon_i$$

Model III: $$\frac{MV_i}{(Sales)}=\alpha_0+\alpha_1\frac{BV_i}{(Sales)}+\alpha_2\frac{AER_i^a}{(Sales)}+\alpha_3 v_i+\varepsilon_i$$

Model IV: $$\frac{MV_i}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)}=\alpha_0+\alpha_1\frac{BV_i}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)}+\alpha_2\frac{AER_i^a}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)}+\alpha_3 v_i+\varepsilon_i$$

Deflator	No. of Shares Outstanding			Book Value of Capital		
	Coefficient	t-statistic		Coefficient	t-statistic	
CP	0.003	3.63	***	-0.003	-1.63	
BV	0.038	59.38	***	0.050	59.38	***
AER^a	0.002	26.88	***	0.008	26.88	***
Constant	0.003	2.20	**	0.003	2.20	**
Adj. R^2	0.670			0.670		
MSE	0.073			0.67		
No. of obs.	6,784			6,784		

Deflator	Sales			Opening Market Value of Assets		
	Coefficient	t-statistic		Coefficient	t-statistic	
CP	0.001	2.71	***	-0.235	-0.41	
BV	0.074	265.85	***	0.087	12.27	***
AER^a	0.012	254.06	***	0.011	3.87	***
Constant	–0.001	–1.22		0.002	53.06	***
Adj. R^2	0.944			0.105		
MSE	0.052			0.11		
No. of obs.	6,784			6,784		

Notes:

[a] The dependent variable is the market value of equity for firm *i* (*MV*) on the last date of the annual report announcements; BV_i is the book value of equity; abnormal earnings, AER_i^a, is given by $AER_i^a \equiv Earnings_i - r_f \cdot BV_i$, where r_f is the one-period risk-free rate of return; v_i is other value-relevant information, addressing the comprehensive disclosure (*CP*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

In addition, It is also examined by the Ohlson model with the opening market value of assets (Barth et al., 1998 and Akbar and Stark, 2003) and the book value of capital (Green et al., 1996; Rees, 1997; Chen, 2003 and Akbar and Stark, 2003) as the deflators. However, the effects of comprehensive disclosure on compensation are insignificant, inconsistent the previous regressions. It is suggested that these insignificant results are due to the reason that the contaminated deflators of opening market value of and book value of capital can be easily manipulated by firms. The inconsistent results from the Ohlson model can be further explored in the future by using different other deflators, such as book value of equity.

4.3 Sub-sample Analysis

I further decompose the data into two sub-samples comprising of 'electronics' firms using larger proportions of stock bonuses and 'non-electronics' firms which are generally regarded as having relatively weak governance mechanisms. Prior to the 2006 amendment of the Business Accounting Law, stock-based bonuses were not recorded as remuneration. Stock bonuses paid to executives and directors prior to 2006 are treated as distributed earnings in the *Retained Earnings Statement*. However, despite the fact that par-value stock-based bonuses do provide incentives for executives, the market value of such bonuses is extremely difficult to evaluate. Furthermore, there are many other mechanisms though which the directors and executives are compensated, instead of the regular equity shares or stock options. This may therefore provide a particularly useful way for executives and directors to camouflage their earnings. Thus, outsiders are no longer able to use the disclosure of compensation shown in the tables as the sole means of identifying agency problems (Core et al., 1999), particularly for (high-tech) electronics firms in Taiwan since these

firms tend to use large proportions of stock bonuses, with different lock-up periods along with varied exercise conditions, as the means of distributing the benefits of the considerable growth in their stock prices.

The coefficients of *CP* in Models I, II and III of Table 7 are insignificant, thereby providing inconclusive evidence on Hypothesis 1; thus, for firms using larger proportions of stock bonuses, the greater transparency of their compensation disclosure appears to be of no help in the creation of firm value. The coefficients of *CP* in Models IV, V and VI of Table 7 are significantly positive; the economic significance for non-electronics firms is a higher market valuation, as compared to that for electronics firms which tend to use large proportions of difficult-to-value stock bonuses (0.022 > 0.008). Whilst providing support for Hypothesis 1, this also suggests that a higher market value is created for non-electronics firms – characterized as being relatively weakly governed – when comprehensive information on compensation is disclosed which satisfies the needs of outsiders and brings additional marginal benefits with regard to identifying agency conflicts.

The evidence presented from Tables 5 and 7 suggests that investors have a clear need for detailed information on the compensation awards made to directors and executives. Thus, comprehensive disclosure provides signals of better governance structures, leading to positive effects on the market value of firms. However, for firms using significant proportions of stock bonuses as the means of camouflaging their earnings, comprehensive disclosure of compensation is found to have no additional marginal benefits to identify the potential agency conflicts, further leading to insignificant effect on market value.

Table 7 The Effects of Comprehensive Disclosure of Compensation for the Sub-samples

This table presents the estimated coefficients from the following regression models.
Model I and IV:

$$Q_i = \alpha_1 + \delta^1 CP_i + \beta_1^1 SIZE_i + \beta_2^1 DEBT_i + \beta_3^1 INVST_i + \beta_4^1 FCF_i + \beta_5^1 ROA_i + \beta_6^1 EPS_i + \varepsilon_i^1$$

Model II and V:

$$Q_i = \alpha_2 + \delta^2 DCP_i + \beta_1^2 SIZE_i + \beta_2^2 DEBT_i + \beta_3^2 INVST_i + \beta_4^2 FCF_i + \beta_5^2 ROA_i + \beta_6^2 EPS_i + \varepsilon_i^2$$

Model III and VI:

$$Q_i = \alpha_3 + \delta^3 ECP_i + \beta_1^3 SIZE_i + \beta_2^3 DEBT_i + \beta_3^3 INVST_i + \beta_4^3 FCF_i + \beta_5^3 ROA_i + \beta_6^3 EPS_i + \varepsilon_i^3$$

	Electronics Firms					
	Model I		Model II		Model III	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.008	1.52	–	–	–	–
DCP	–	–	0.008	1.43	–	–
ECP	–	–	–	–	0.007	1.23
SIZE	–0.020	−5.93***	−0.020	−5.92***	−0.020	−5.88***
DEBT	–0.011	−36.27***	−0.011	−36.30***	−0.011	−36.27***
INVST	0.001	1.73*	0.001	1.71*	0.001	1.69*
FCF	0.0001	4.79***	0.0001	4.89***	0.0001	4.82***
ROA	0.002	4.80***	0.002	4.90***	0.002	4.83***
EPS	0.001	4.79***	0.001	4.89***	0.001	4.82***
Constant	0.270	5.38***	0.269	5.36***	0.269	5.34***
Adj. R^2	0.364		0.364		0.364	
MSE	0.234		0.234		0.234	
Obs.	2,374		2,374		2,374	

	Non-electronics Firms					
	Model IV		Model V		Model VI	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.022	2.34**	–	–	–	–
DCP	–	–	0.021	2.28**	–	–
ECP	–	–	–	–	0.019	2.09**
SIZE	−0.014	−5.94***	−0.014	−5.94***	−0.014	−5.91***
DEBT	−0.010	−61.73***	−0.008	−60.98***	−0.010	−61.77***
INVST	0.001	3.04***	0.001	3.04***	−0.001	3.00***
FCF	0.0001	0.09	0.0001	0.09	0.0001	0.09
ROA	0.001	0.97	0.001	0.98	0.0007	0.95
EPS	0.002	0.01	0.001	0.01	0.002	0.01
Constant	0.243	6.93***	0.243	6.92***	0.242	6.91***
Adj. R^2	0.489		0.489		0.489	
MSE	0.178		0.178		0.178	
Obs.	4,410		4,410		4,410	

Notes:

[a] The dependent variable is the Tobin's *Q* (*Q*), which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets. If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. If the firm discloses comprehensive information only on executive compensation, then *ECP* takes the value of 1, otherwise 0. Similarly, if the firm discloses comprehensive information only on director compensation, then *DCP* takes the value of 1, otherwise 0. The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

4.4 Endogeneity and Self-selection Bias

Since firms will choose their level of disclosure based upon consideration of the costs and benefits associated with comprehensive disclosure, CP_i will be endogenous, and as such, the OLS regressions would tend to suffer from self-selection bias. As noted in the political cost hypothesis of Wagenhofer (1990), if the comparative benefits of comprehensive disclosure are greater than the costs, a firm will self-select its preferred choice to signal a higher level of transparency (Christensen and Feltham, 2000; Suijs, 2005). Leuz and Verrecchia (2000) also adopt the self-selection model to examine the effects of increased disclosure levels.

For taking into account the potential self-selection bias, the process of deciding the choice of voluntary disclosure has to be specified. It is supposed that there is an unobservable utility of interest U_{CP} concerning the disclosure of compensation paid to directors and executives. The utility of choice can be specified as following.

$$U_{i,CP=1} = \mathbf{Z}_i \boldsymbol{\gamma}_{CP=1} + \eta_{i,CP=1}; \quad U_{i,CP=0} = \mathbf{Z}_i \boldsymbol{\gamma}_{CP=0} + \eta_{i,CP=0} \tag{5}$$

where $U_{i,CP=1}$ is the utility concerning the comprehensive disclosure of compensation for firm i ($CP = 1$); whilst $U_{i,CP=0}$ is the one concerning non-comprehensive disclosure ($CP = 0$); $\mathbf{Z}$ is a vector of determinants of whether a firm will voluntarily disclose comprehensive information on compensation for directors and executives; $\boldsymbol{\gamma}$ is a vector of parameters to be estimated; and $\eta_{i,CP}$ is the error term.

If the relative benefits of comprehensive disclosure are larger than its costs, the firm will choose to signal high quality of transparency by providing comprehensive disclosure of compensation (Christensen and Feltham, 2000; Hyytinen and Pajarinen, 2005). This study follows this proposition and suggest that if the utility concerning the comprehensive disclosure is larger than the one concerning the non-comprehensive disclosure, $U_{i,CP=1} > U_{i,CP=0}$, the firm will voluntarily disclose comprehensive

information on director and executive compensation in the annual financial report. The difference between the two utility functions can be specified as the bivariate choice.

$$CP_i = \mathbf{I}\left(U_{i,CP=1} > U_{i,CP=0}\right) = \mathbf{I}\left(\mathbf{Z}_i \underset{\sim}{\gamma}^* + \eta_i^* > 0\right) = \mathbf{I}\left(CP_i^* > 0\right) \quad (6)$$

where $\eta_i^* = \eta_{i,CD=1} - \eta_{i,CD=0}$; and $\boldsymbol{\gamma}^* = \boldsymbol{\gamma}_{CP=1} - \boldsymbol{\gamma}_{CP=0}$.

Following Heckman (1979), the error term, η_i^* is assumed to follow a symmetric distribution, determined as standard normal assumption. CP_i^* is an unobserved continuous latent variable of interest that can be measured by another observable discrete variable CP_i and **I**(•) is an identity mapping. That is, if a firm evaluate the disclosure decisions and find that the benefits of comprehensive disclosure is larger than its costs ($U_{CP=1} > U_{i,CP=0}$; $CP_i^* > 0$), then it will voluntarily disclose comprehensive information on compensation paid to directors and executives ($CP = 1$).

In response to the potential problems of endogeneity and self-selection bias, the two-stage Heckman model is adopted. Following Heckman (1979), the probit model could be adopted to control the problem of endogeneity and self-selection effect. It is also able to determine the expectation of index function as a probability through the mapping from the transformation function, denoted by F.

$$E\left[CP_i \middle| \mathbf{Z}_i\right] = F\left[\mathbf{Z}_i \underset{\sim}{\gamma}\right] = \Phi\left(\mathbf{Z}_i \underset{\sim}{\gamma}\right) = \int_{-\infty}^{\mathbf{Z}_i \underset{\sim}{\gamma}} \varphi(t)\, dt, \quad (7)$$

where Φ is the cumulative density function and $\varphi(t) = (2\pi)^{-1/2} \exp\left\{-t^2/2\right\}$. With the two-stage self-selection model, the parameters are estimated using the Heckit procedure (Heckman, 1979). In the first stage, the inverse Mills ratio that captures the self-selection effect is obtained from the probit model in the selection (disclosure) equation.

$$CP_i^* = \alpha + \mathbf{Z}_i\boldsymbol{\gamma} + \eta_i$$
$$\begin{cases} CP_i = 1 \ \ if \ \ CP_i^* > 0 & \left(i.e.\ U_{CP=1} > U_{CP=0}\right) \\ CP_i = 0 \ \ if \ \ CP_i^* < 0 & \left(i.e.\ U_{CP=1} < U_{CP=0}\right) \end{cases} \tag{8}$$

where $\boldsymbol{\gamma}$ is a vector of the parameters to be estimated by regressing CP_i on a vector of the instrumental variables (**Z**). The vector **Z** includes the control variables in Model (1) and the instruments for comprehensive disclosure. α is the parameter to be estimated.

The conditional expected market value of the firm with or without voluntary disclosure of comprehensive information on compensation paid to directors and executives are further specified as following.

$$\begin{aligned} E\left(Q_i \middle| \mathbf{X}, CP_i = 1\right) &= \alpha + \mathbf{X}_i\boldsymbol{\beta} + \delta \cdot CP_i + \rho_{\varepsilon,\eta}\sigma_\varepsilon \ \lambda_{i,CP=1}\left(\mathbf{Z}_i\boldsymbol{\gamma}\right) \\ E\left(Q_i \middle| \mathbf{X}, CP_i = 0\right) &= \alpha + \mathbf{X}_i\boldsymbol{\beta} + \rho_{\varepsilon,\eta}\sigma_\varepsilon \ \lambda_{i,CP=0}\left(\mathbf{Z}_i\boldsymbol{\gamma}\right) \end{aligned} \tag{9}$$

where $\lambda_{i,CP=1}(\bullet)$ is the inverse Mills ratio used to adjust the self-selection effect caused by the choice of comprehensive disclosure, $\lambda_{i,CP=1}\left(\mathbf{Z}_i\boldsymbol{\gamma}\right) = \varphi\left(\mathbf{Z}_i\boldsymbol{\gamma}\right) \Big/ \Phi\left(\mathbf{Z}_i\boldsymbol{\gamma}\right)$ and $\lambda_{i,CP=0}\left(\mathbf{Z}_i\underset{\sim}{\boldsymbol{\gamma}}\right) = \left[-\varphi\left(\mathbf{Z}_i\boldsymbol{\gamma}\right)\right] \Big/ \left[1 - \Phi\left(\mathbf{Z}_i\boldsymbol{\gamma}\right)\right]$. $\varphi(\bullet)$ is the standard normal distribution and $\Phi(\bullet)$ is its corresponding cumulative distribution function.

The first-stage disclosure equation can be estimated by the probit model:

$$\begin{aligned} CP_i^* = \alpha &+ \underset{\sim}{\mathbf{Z}_i}\underset{\sim}{\boldsymbol{\gamma}} + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i \\ &+ \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \eta_i \end{aligned}$$

$$\begin{aligned} CP_i &= 1 \quad if \ \ CP_i^* > 0 \\ CP_i &= 0 \quad if \ \ CP_i^* \le 0 \end{aligned} \tag{10}$$

where CP_i^* is the unobservable net benefit of comprehensive disclosure; CP_i is equal to 1 only when the net benefits of comprehensive disclosure (CP_i^*) are greater than zero, thereby inducing the firm to voluntarily provide comprehensive disclosure of compensation.

The instruments comprising of proxies of board independence encompass two dimensions of internal governance mechanisms: ownership structure and the board of directors. The criterion of ownership includes the proportion of shares owned by domestic trust funds, outside funds, managers, controlling directors, family funds, family unlisted corporations and the critical controlling shareholding. The criterion for the board of directors includes the proportion of directors appointed by outside listed corporations and family unlisted corporations, the proportion of supervisors appointed by outside listed corporations and outside funds, and the size of the board.

Using the instruments and their corresponding parameters, it can further calculate the term $\lambda_i = \left[\phi\left(\underset{\sim}{\mathbf{Z}}_i \underset{\sim}{\gamma}_{13}\right)/\Phi\left(\underset{\sim}{\mathbf{Z}}_i \underset{\sim}{\gamma}_{13}\right)\right]\cdot CP_i + \left[\left(-\phi\left(\underset{\sim}{\mathbf{Z}}_i \underset{\sim}{\gamma}_{13}\right)\right)/\Phi\left(\underset{\sim}{\mathbf{Z}}_i \underset{\sim}{\gamma}_{13}\right)\right]\cdot(1-CP_i)$ to correct for the self-selection bias, where $\varphi(\cdot)$ and $\Phi(\cdot)$ are the respective density function and cumulative distribution function for the standard normal. The second stage involves the OLS estimation in the valuation model which includes the addition of the λ_i regressor and the fitted values of comprehensive disclosure ($\hat{CP}_i$).

$$\begin{aligned} Q_i = \alpha \ &+ \delta\, \hat{CP}_i + \beta\, SIZE_i + \beta\, DEBT_i + \beta\, INVST_i \\ &+ \beta\, FCF_i + \beta\, ROA_i + \beta\, EPS_i + \sigma_{\varepsilon,\eta}\lambda_i + \varepsilon_i \end{aligned} \tag{11}$$

where $\sigma_{\varepsilon,\eta}$ is the error term covariance, with ε_i and η_i, satisfying certain assumptions. These assumptions are: (i) that the two error terms follow bivariate normal distribution with unity normalized standard deviations, σ_ε^2 and σ_η^2, and correlation $\rho_{\varepsilon,\eta}$, i.e., $\varepsilon_i, \eta_i \sim N(0, 0, \sigma_\varepsilon^2, 1, \rho_{\varepsilon,\eta})$; and (ii) that $\varepsilon_i|\eta_i = \sigma_{\varepsilon,\eta}\eta_i + v_i$, where $v_i \sim N(0,1)$ and $E(\varepsilon_i|\eta_i) = \sigma_{\varepsilon,\eta}\eta_i$.

As noted in many of the prior studies, the instruments determining comprehensive disclosure may be attributable to the level of board independence (Core et al., 1999; Core, 2001; Ryan and Wiggins, 2004; Makhija and Patton, 2004; Gordon, 2005; Laksmana, 2008). Khanna et al. (2004) find that Taiwan has a relatively lower

governance index, essentially as a result of higher family control, pyramidal structures and lower transparency. The internal governance mechanisms of ownership structure and board composition are therefore adopted as instruments in the present study.

Since Bushee and Noe (2000) and Barako et al. (2006) argue that outside shareholders require higher disclosure standards, this study takes the percentage of shares owned by domestic trust funds (%*DTF*) and the percentage of shares owned by outside funds that are not controlled by major shareholders (%*OF*) as additional instruments. Major shareholders are defined as investors owning a significant proportion (10 per cent) of the shares. For newly-listed companies, major shareholders are defined as investors who are ranked in the top ten, in terms of total holding stake, or those with more than a 5 per cent holding stake in the company.

The share interests of managers are maximized by their greater willingness to provide higher disclosure transparency, thereby further increasing the market value of the firm (Core, 2001; Nagar et al., 2003; Makhija and Patton, 2004). However, it is noted in Nagar et al. (2003) that managers focusing on personal interests may be reluctant to disclose private information, particularly in those circumstances where there is a lack of any real incentives. The proportion of shares owned by executives (%*MNG*) is therefore taken as an instrumental variable.

Concentrated ownership could lead to lower transparency and fraudulent activities, particularly in firms with poor board independence. Thus, several studies suggest that disclosure may reduce the information advantages of insiders (Holland, 1998; Huddart et al., 1999; Hossain et al., 2005) and Bannister and Newman (2006). This study therefore includes two additional instruments, controlling directors (%*CD*), which is measured as the percentage of shares owned by major shareholders on the board, and critical control (%*CC*), which is the percentage of shares the major directors need to

hold to achieve absolute voting power or control rights (Cubbin and Leech, 1983).

Another property of the Taiwanese data is the prevalence of family control, which is common to many Asian and European capital markets. Setia-Atmaja et al. (2007) find that the board independence is lower in family firms, whilst Chen et al. (2008) suggest that firms with higher family ownership tend to disregard voluntary disclosure practices. Therefore, the percentage of shares that are owned by foundations controlled by family directors (%*FF*) and the percentage of shares that are owned by unlisted companies controlled by family directors (%*FU*) are both included as instruments.

Byrd et al. (1998) argue that factors encouraging compensation committees to provide voluntary disclosure are the major concerns of external stakeholders. Soffer (1998) also suggests that such concerns provide a mechanism which can effectively disclose poor compensation practices. Furthermore, both Ho and Wang (2001) and Hossain et al. (2005) find positive associations between voluntary disclosure and the proportion of independent directors on the board. Therefore, the proportion of directors and supervisory representatives appointed by outside listed corporations, (*OCD* and *OCS*), and the percentage of supervisory representatives of outside funds (*OFS*), none of which are controlled by major shareholders, are included as instruments.

However, a higher proportion of family directors may also be detrimental to board independence (Chen et al., 2008). The percentage of directors appointed by unlisted corporations under family director control (*FCD*) is therefore taken as an additional instrument.

Since the positive association between board size and firm performance can be strengthened by the greater monitoring power arising from larger board size (Dalton et al., 1999; Certo et al., 2001), firms with such monitoring power will tend to voluntarily provide comprehensive disclosure. However, several studies suggest that as boards

become smaller, they may also become more capable of holding frank discussions and engaging in more effective monitoring (Jensen, 1993; Vafeas, 2000; Gordon et al., 2002). As a result, smaller board size can enhance the informative nature of disclosure. Board size (*BSIZE*), measured as the ratio of the total number of directors to the natural log of total assets, is therefore taken as an additional instrument.

I further examine whether comprehensive disclosure leads to a higher market value after controlling for potential problems of endogeneity and self-selection bias. Table 8 reveals that λ_i is significant, indicating that the choice of comprehensive disclosure is not random, and that self-selection bias is prevalent in our setting. In particular, various monitoring mechanisms, including the pressure provided by fewer insiders, more outsiders, smaller board size, higher managerial shareholdings, lower family control and diversified ownership, are all found to lead to higher levels of transparency. The evidence suggests that under a scenario within which firms are given broad discretion with regard to their provision of greater levels of transparency, firms with higher levels of board independence will voluntarily provide comprehensive disclosure of compensation, thereby leading to higher market value.

Although the evidence shows that the instruments of board independence can reduce the potential problem of endogeneity and self-selection bias, those instruments themselves could also be faced with another endogeneity problem. Since firms with better governance mechanisms may voluntarily provide comprehensive disclosure of compensation, whilst they are also more likely to provide higher independence of the board. Such phenomenon leads to a potential problem that board independence taken as exogenous instrument and comprehensive disclosure of compensation are simultaneously determined by other factors, such as other criteria of internal governance mechanisms or the overall governance practices. Another candidate of the

exogenous instrument is the level of competitiveness in their industries. Since firms could face non-discernible pressures from manager labor market, further changing the transparency level of compensation information that is valuable to identify the firm's future strategies, the executives' capability, and competitiveness in its industry.

Table 8 The Effects of Comprehensive Disclosure of Compensation with Heckman Self-selection Model

This table presents the estimated coefficients from the following regression models.
Disclosure Model:

$$CP_i^* = \alpha + \mathbf{Z}_i \underset{\sim}{\gamma} + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \eta_i$$

$$CP_i = 1 \quad if \ CP_i^* > 0; \quad CP_i = 0 \quad if \ CP_i^* \le 0$$

Valuation Model:

$$Q_i = \alpha + \delta \hat{CP}_i + \beta \ SIZE_i + \beta \ DEBT_i + \beta \ INVST_i + \beta \ FCF_i + \beta \ ROA_i + \beta \ EPS_i + \sigma_{\varepsilon,\eta}\lambda_i + \varepsilon_i$$

	Ownership Structure as Instruments			
	Model I		Model II	
	Coefficient	z-statistic	Coefficient	t-statistic
CP	–	–	0.963	8.29***
%DTF	1.183	2.55**	–	–
%OF	1.833	5.21***	–	–
%MNG	0.366	0.68	–	–
%CD	−0.569	−7.44***	–	–
%CC	−0.864	−3.70***	–	–
%FF	−1.453	−4.33***	–	–
%FU	−0.586	−3.97***	–	–
OCD	–	–	–	–
OCS	–	–	–	–
OFS	–	–	–	–
FCD	–	–	–	–
BSIZE	–	–	–	–
SIZE	0.091	5.79***	−0.013	−5.55***
DEBT	0.002	1.93*	−0.010	−64.12***
INVST	0.008	5.52***	−0.001	−3.19***
FCF	0.0001	1.76*	0.0001	−0.01
ROA	0.003	1.75*	0.004	3.04***
EPS	0.035	1.75*	0.059	0.02
Constant	−1.963	−8.29***	−0.252	−5.33***
λ	–	–	−0.029	−4.26***
$\rho_{\varepsilon,\eta}$	–		−0.188	
σ_{ε}	–		0.154	
No. of obs.	6,784		6,784	

	Board Composition as Instruments			
	Model I		Model II	
	Coefficient	z-statistic	Coefficient	t-statistic
CP	–	–	1.003	5.51***
%DTF	–	–	–	–
%OF	–	–	–	–
%MNG	–	–	–	–
%CD	–	–	–	–
%CC	–	–	–	–

%FF	–	–	–	–
%FU	–	–	–	–
OCD	0.799	2.76***	–	–
OCS	2.810	4.73***	–	–
OFS	0.844	0.86	–	–
FCD	−0.006	−0.10	–	–
BSIZE	−0.096	−1.14	–	–
SIZE	0.047	3.69***	−0.029	−6.78***
DEBT	0.003	3.26***	0.010	35.97***
INVST	0.012	7.99***	−0.003	−4.54***
FCF	0.0001	1.73*	0.0001	−0.48
ROA	0.003	1.72*	0.008	4.31***
EPS	0.072	1.73*	0.063	−0.21
Constant	−1.003	−5.51***	0.710	6.74***
λ	–	–	−0.264	−4.09***
$\rho_{\varepsilon,\eta}$	–		−0.877	
σ_{ε}	–		0.301	
No. of obs.	6,784		6,784	

Notes:

[a] In the first-stage disclosure equation (Model I), the dependent variable is comprehensive disclosure (*CP*). If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. The instrumental variables (**Z**) include the proportion of shares owned by domestic trust funds (*%DTF*), the proportion of shares owned by outside funds (*%OF*), the proportion of shares owned by managers (*%MNG*), the proportion of shares owned by controlling directors (*%CD*), the critical controlling shareholding (*%CC*), the proportion of shares owned by family funds (*%FF*), the proportion of shares owned by family unlisted corporations (*%FU*), the proportion of directors appointed by outside listed corporations (*OCD*), the proportion of supervisors appointed by outside listed corporations (*OCS*), the proportion of supervisors appointed by outside funds (*OFS*), the proportion of directors appointed by family unlisted corporations (*FCD*) and the size of the board (*BSIZE*). The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*).

[b] In the second-stage valuation equation (Model II), the dependent variable is the Tobin's *Q* (*Q*), which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets. the coefficient on λ examines the effect of self-selection bias; $\rho_{\varepsilon,\eta}$ is the correlation of the error terms in the disclosure and valuation equation; σ_{ε} is the standard deviation of the error term in the second-stage equation.

[c] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

4.5 Time-series Effect

In order to control for the potential time-series effect, this study examines the effect of compensation disclosure on firm value, not only by year, but also under a fixed effects model. The evidence shows that most of the effects on firm value arising from the comprehensive disclosure of compensation are significantly positive. The coefficient on *CP* in the fixed-effects model shows an economically significant premium in market value of 12 per cent, indicating the firm's response to the needs of outsiders for comprehensive disclosure on compensation. Semykina and Wooldridge (2005) indicate that when the potential problem of endogeneity within the primary equation comes as a result of self-selection bias, inconsistent estimations may be obtained from the application of either the fixed-effects or the random-effects model.

The coefficient estimates of *CP* may therefore be inconsistent (Table 9). The insignificant effects found in the 1996-1998 data may be attributable to the Asian financial crisis and the subsequent bubbles, whilst another explanation may be that the economic consequences of voluntary disclosure were pre-matured at the start of the policy reforms. However, the results of the 1999-2008 data provide support for Hypothesis 1, that firms providing comprehensive disclosure of information on compensation have a higher market value. Furthermore, the same findings are also revealed by the panel data analysis.

Table 9 The Effects of Comprehensive Disclosure on Compensation with Time-series Effects

This table presents the estimated coefficients from the following regression models.

$$Q_i = \alpha_1 + \delta\ CP_i + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i^1$$

	1996		1997		1998	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.113	1.22	0.038	0.30	0.094	0.93
ROA	0.057	2.59 **	0.039	1.25	0.071	5.00 ***
EPS	0.047	0.66	0.142	1.36	0.107	2.54 **
INVST	0.007	2.17 **	-0.001	-0.16	0.003	1.01
FCF	-0.003	-0.52	0.005	0.76	0.012	2.21 **
SIZE	-0.056	-1.31	-0.099	-1.64	-0.015	-0.32
DEBT	-0.012	-3.57 ***	-0.002	-0.49	-0.001	-0.36
Cons.	2.664	4.19	3.020	3.33***	1.317	1.90*
Adj. R^2	0.218		0.171		0.213	
MSE	0.672		0.916		0.756	
Obs.	262		268		301	

	1999		2000		2001	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.106	1.91*	0.019	2.16 **	0.238	2.70 ***
ROA	0.053	2.91 ***	0.083	6.24 ***	0.027	2.54 **
EPS	0.091	1.47	0.077	1.72 *	0.083	2.40 **
INVST	0.009	2.35 **	0.001	0.37	-0.002	-0.03
FCF	0.009	1.10	0.015	2.49 **	0.014	2.85 ***
SIZE	0.150	2.62 ***	-0.008	-0.18	0.121	3.60 ***
DEBT	-0.005	-1.01	-0.004	-1.18	-0.001	-0.21
Cons.	-1.675	-1.97*	0.603	0.89	-1.127	-2.25 **
Adj. R^2	0.301		0.240		0.274	
MSE	1.061		1.018		0.844	
Obs.	339		420		516	

	2002		2003		2004	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.139	2.83 ***	0.071	3.40 ***	0. 075	4.91 ***
ROA	0.054	8.86 ***	0.030	5.23 ***	0.007	2.00 **
EPS	0.009	0.52	0.097	5.33 ***	0.060	4.96 ***
INVST	-0.004	-0.25	-0.003	-2.15 **	0.041	0.47
FCF	-0.001	-0.33	0.006	2.07 **	0.006	3.12 ***
SIZE	0.350	0.01	-0.025	-1.27	0.020	1.35
DEBT	-0.002	-1.13	-0.004	-0.11	-0.001	-0.45
Cons.	0.777	2.79 ***	1.395	4.79 ***	0.694	3.06 ***
Adj. R^2	0.426		0.490		0.327	
MSE	0.488		0.534		0.33	
Obs.	577		622		642	

	2005		2006		2007	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.103	4.01 ***	0.076	5.32 ***	0.087	3.55 ***
ROA	0.007	1.54	0.017	3.28 ***	0.025	10.38 ***
EPS	0.184	13.09 ***	0.075	6.29 ***	0.072	9.89 ***
INVST	0.002	0.10	0.001	0.61	0.001	1.13
FCF	0.005	3.62 ***	0.011	3.44 ***	0.008	7.44 ***
SIZE	-0.021	-1.07	-0.050	-2.12 **	0.0003	0.03
DEBT	-0.002	-0.06	-0.001	-0.05	-0.001	-0.04
Cons.	1.240	4.00 ***	1.846	5.14 ***	1.022	7.23 ***
Adj. R^2	0.460		0.326		0.3125	
MSE	0.593		0.708		0.5454	
Obs.	651		661		735	

	2008		Panel Data	
	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.149	4.50 ***	0.120	5.18 ***
ROA	0.025	10.39 ***	0.025	10.35 ***
EPS	0.071	9.88 ***	0.072	9.91 ***
INVST	0.001	1.15	0.001	1.12
FCF	0.008	7.41 ***	0.008	7.46 ***
SIZE	0.001	0.07	0.0004	0.04
DEBT	-0.002	-0.11	-0.001	-0.08
Cons.	0.969	6.75 ***	1.001	7.10 ***
Adj. R^2	0.3146		0.3144	
MSE	0.5439		0.5439	
Obs.	790		6784	

Notes:

[a] The dependent variable is the Tobin's *Q* (*Q*). If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

4.6 The Effects of Non-comprehensive Disclosure

The foregoing evidence suggests that comprehensive disclosure of information on compensation provides a higher market value. However, within the extant literature on the economic consequences of compensation disclosure, it remains unclear as to whether similar effects on market value will be obtained for compensation disclosure at medium levels of transparency. Wagenhofer (1990) argues that if discretionary choice provides firms with such flexibility with regard to the level of transparency, then they will generally prefer to adopt only partial disclosure. Lo (2003) also suggests that firms will elect to provide only partial disclosure if there are coexisting costs and benefits related to compensation disclosure. Thus, firms may elect to provide non-comprehensive disclosure as opposed to comprehensive disclosure in order to avoid any increase in the non-proprietary costs arising from full disclosure.

The data on non-comprehensive disclosure is further decomposed into 'medium' or 'minimal' disclosure. The term 'minimal disclosure' indicates that firms comply only with the mandatory requirements for disclosure of information on compensation in their annual reports (second column of Table 1). Therefore, any additional requirement for mandatory disclosure during the regulatory changes in the subsequent years is included within our measurement of minimal disclosure. However, the regulatory changes on voluntary disclosure are not adopted by minimal disclosure firms (see Appendix, Table A3). 'Medium disclosure' indicates that by adopting the regulatory changes, the firms are providing compensation information on all of the mandatory requirements whilst also complying with some elements of voluntary disclosure, where such level of transparency is in excess of the mandatory disclosure, but falls short of comprehensive disclosure (see Appendix, Table A3).

It further quantifies the two types of non-comprehensive disclosure as our index

variables (Table 2). If the firm is found to be voluntarily providing 'medium disclosure' not only on the compensation paid to its executives, but also on the compensation paid to its directors, then *MD* takes the value of 1, otherwise 0. If the firm discloses medium-level information only on executive compensation, then *EMD* takes the value of 1, otherwise 0. Similarly, if the firm discloses medium-level information only on director compensation, then *DMD* takes the value of 1, otherwise 0. Finally, if the firm provides only 'minimal disclosure' on the compensation paid to both its executives and directors, then *MN* takes the value of 1, otherwise 0. If the firm discloses minimal-level information only on executive (director) compensation, then *EMN* (*DMN*) takes the value of 1, otherwise 0.

Given that the disclosure of inappropriate incentives may lead to potential outrage, although executives will choose to provide non-comprehensive disclosure of executive compensation, it will nevertheless be in excess of the mandatory requirements (*ECP* = 0; *EMD* = 1; *EMN* = 0). In such cases (*CP* = 0; *MD* = 1; *MN* = 0), outsiders may presume that the firm is faced with severe agency problems. Regarding the measurement of comprehensive disclosure, *DMD* and *EMD* are subsets of *MD*, that is *MD* = 1 only if *DMD* and *EMD* are simultaneously equal to 1. The coding system is also applied to the minimal disclosures (*MN*, *DMN* and *EMN*). Comprehensive disclosure on the compensation paid to managing directors provides greater insights into the extent to which the firms are faced with agency conflicts. From the detailed information provided in Table D, for example, outsiders can gain an understanding that a powerful managing director may attempt to influence the compensation committee to rearrange his compensation contract to include several inappropriate incentives and self-serving benefits. A substantial reduction in the proportion of firms providing minimal disclosure, from 11.83 per cent in 1996 to 0.89 per cent in 2008, is revealed in Table 3.

It surmises that this is because the gradual enforcement and changing requirements are pushing these listed companies towards higher levels of transparency in their compensation disclosure.

Given the growth in newly-listed firms, there has also been corresponding growth in the proportion of firms providing medium disclosure, from 28.63 per cent in 1996 to 83.29 per cent in 2008. Pagano et al. (1998) note that firms going public will be burdened with the additional costs of auditing brought about by disclosure requirements. Wagenhofer (1990) also argues that firms will prefer to provide only partial disclosure because they can then decide to disclose only that information which is of a favorable nature. Although Cooper and Grinder (1996), Guo et al. (2004) and Cerbioni and Parbonetti (2007) suggest that IPO firms have less discretion in their disclosure content, this is not the case for the voluntary disclosure of information on compensation in Taiwan. Therefore, the tendency for increasing numbers of firms in Taiwan to provide medium disclosure is consistent with the argument pursued in both Easley and O'hara (2004) and Hribar (2004), that if such disclosure is not compulsory, then IPO firms have lower levels of transparency and higher information asymmetry.

Including *MD* as an additional variable in regression (1), it goes on to examine whether medium levels of disclosure of information on the compensation paid to directors and executives, as compared to only minimal disclosure, can help to create additional market value. The act of camouflaging information on compensation provides a signal that the firm is burdened with potential agency conflicts and rent-seeking behavior. It is therefore expected to find that such opaque compensation disclosure will have neutral effects on market value.

$$\begin{aligned} Q_i = \alpha \ &+ \delta_1 CP_i + \delta_2 MD_i + \beta_1 SIZE_i + \beta_2 DEBT_i \\ &+ \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i \end{aligned} \tag{12}$$

Table 10 The Effects of Medium Level of Compensation Disclosure on Firm Value with OLS Model

This table presents the estimated coefficients from the following regression models.

$$Q_i = \alpha_1 + \delta\ CP_i + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \varepsilon_i$$

	Model I Full Sample		Model II Electronics firms as sub-sample		Model III Non-electronics firms as sub-sample	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
CP	0.004	3.52***	0.016	3.88***	0.009	2.67***
MD	–0.025	–2.01	–0.006	–0.32	0.023	2.67***
SIZE	–0.016	–8.45***	–0.020	–5.92***	–0.015	–6.19***
DEBT	–0.010	–71.84***	–0.011	–36.25***	–0.010	–61.74***
INVST	0.054	3.48***	0.037	1.75*	0.004	3.25***
FCF	0.0001	0.44	0.0001	4.71***	0.0001	0.09
ROA	0.0001	3.00***	0.002	4.72***	0.0001	1.07
EPS	0.060	0.42	0.059	4.71***	0.060	0.04
BV	–	–	–	–	–	–
AER[a]	–	–	–	–	–	–
Constant	2.888	9.38***	0.278	4.98***	0.273	7.42***
Adj. R^2	0.428		0.364		0.489	
MSE	0.202		0.234		0.178	
No. of Obs.	6,784		2,374		4,410	

Notes:

[a] The dependent variable in Models I, II, and III is the Tobin's *Q* (*Q*), which is defined as the sum of the firm's market capitalization and the book value of debt, divided by the book value of total assets. If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. If the firm is found to voluntarily provide medium disclosure not only on the compensation paid to its executives, but also on the compensation paid to its directors, then *MD* takes the value of 1, otherwise 0. The control variables come under two categories of firm characteristics and profitability. Firm characteristics include firm size (*SIZE*) measured by the natural log of total assets; debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets; proprietary ratio (*INVST*) measured by the ratio of total investment to total assets; and free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets. The profitability includes return on assets (*ROA*) and earnings per share (*EPS*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 11 The Effects of Medium Level of Compensation Disclosure on Firm Value with Ohlson Model

This table presents the estimated coefficients from the following regression models.

Model I: $$\frac{MV_i}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)} = \alpha_0 + \alpha_1 \frac{BV_i}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)} + \alpha_2 \frac{AER_i^a}{\left(\begin{matrix}No.\ of\ Shares\\ Outstanding\end{matrix}\right)} + \alpha_3 v_i + \varepsilon_i$$

Model II: $$\frac{MV_i}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)} = \alpha_0 + \alpha_1 \frac{BV_i}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)} + \alpha_2 \frac{AER_i^a}{\left(\begin{matrix}Book\ Value\\ of\ Capital\end{matrix}\right)} + \alpha_3 v_i + \varepsilon_i$$

Model III: $$\frac{MV_i}{(Sales)} = \alpha_0 + \alpha_1 \frac{BV_i}{(Sales)} + \alpha_2 \frac{AER_i^a}{(Sales)} + \alpha_3 v_i + \varepsilon_i$$

Model IV: $$\frac{MV_i}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)} = \alpha_0 + \alpha_1 \frac{BV_i}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)} + \alpha_2 \frac{AER_i^a}{\left(\begin{matrix}Opening\ Market\\ Value\ of\ Assets\end{matrix}\right)} + \alpha_3 v_i + \varepsilon_i$$

Deflator	No. of Shares Outstanding			Book Value of Capital		
	Coefficient	t-statistic		Coefficient	t-statistic	
CP	0.001	3.70	***	-0.002	-0.70	
MD	–0.001	–1.89	*	0.001	0.30	
BV	0.312	59.38	***	0.000	59.38	***
AER^a	0.008	26.88	***	0.000	26.88	***
Constant	0.002	0.70	**	0.002	0.70	
Adj. R^2	0.670			0.670		
MSE	0.073			0.073		
No. of obs.	6,784			6,784		

Deflator	Sales			Opening Market Value of Assets		
	Coefficient	t-statistic		Coefficient	t-statistic	
CP	0.001	3.33	***	1.873	1.89	*
MD	0.001	0.11		2.627	2.62	***
BV	0.638	265.83	***	0.000	12.34	***
AER^a	0.015	254.05	***	0.000	3.91	***
Constant	–0.001	–0.44		20.275	21.40	***
Adj. R^2	0.944			0.105		
MSE	0.052			0.11		
No. of obs.	6,784			6,784		

Notes:

[a] The dependent variable is the market value of equity for firm *i* (*MV*) on the last date of the annual report announcements; BV_i is the book value of equity; abnormal earnings, AER_i^a, is given by $AER_i^a \equiv Earnings_i - r_f \cdot BV_i$, where r_f is the one-period risk-free rate of return; v_i is other value-relevant information, addressing the comprehensive disclosure (*CP*) and medium disclosure (*MD*).

[b] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Table 10 reveals that the effects of medium disclosure are insignificant, essentially because non-comprehensive disclosure provides a signal that full disclosure may be harmful to the personal benefits of directors and executives. Outsiders can therefore make reasonable assumptions as to the motives behind such non-comprehensive disclosure. Furthermore, external speculation on such camouflaging activities may affect rent bargaining by directors and executives (Verrecchia, 1983); therefore, a medium level of disclosure will be of little help in terms of increasing shareholder wealth (Lo, 2003).

Our analysis of the industry sub-sample in Table 10 shows that the *MD* coefficient is insignificant, which suggests that for those electronics firms which tend to use large proportions of stock bonuses, the higher level of transparency provided in their disclosure of compensation information is of no help whatsoever to the creation of firm value. Conversely, the *MD* coefficient in Table 10 is significantly positive, which suggests that for those non-electronics firms which are characterized as having relatively weak governance structures, a higher market value can still be created when non-comprehensive information is disclosed to satisfy the needs of outsiders, irrespective of the level of transparency (Doidge et al., 2004).

The insignificant results of the Ohlson model, *MD* in Table 11, reveal that after controlling for comprehensive disclosure, the book value of equity and earnings, firms voluntarily adopting medium levels of transparency in their disclosure of information on compensation do not have higher market value. The Ohlson model is also examined with the number of shares outstanding and book value of capital as the deflators, with the results of such analysis also suggesting that medium levels of disclosure are of little help in terms of creating market value. Nevertheless, the slightly significant result of *MD* in Table 11 suggests that with a larger number of shares outstanding, outside investors will believe that non-comprehensive disclosure is being provided, further

presuming poor governance mechanisms in the firm. Therefore, medium levels of disclosure may even be injurious to market value.

4.7 The Effects of Firm Age

The quality of disclosures changes over time, but this also introduces the question of whether there should be an age-of-firm variable that could influence the empirical results. In previous section, it indicates that the IPO firms may prefer medium level of transparency on compensation disclosure. Additional examinations on the effects of firm age are therefore included for robustness in this study. The firm age is defined as the natural log of the age of firm (*AGE*) and taken as an additional regressor for determining the firm value and the disclosure selection as following.

$$Q_i = \alpha + \delta\, CP_i + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \beta_7 AGE_i + \varepsilon_i \quad (13)$$

$$CP_i = \alpha + \underset{\sim}{\mathbf{Z}}_i \underset{\sim}{\boldsymbol{\gamma}} + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \beta_7 AGE_i + \eta_i \quad (14)$$

After including the firm age as additional regressors, it is found that the effects of firm age are insignificant, and the effects of *CP* are significantly positive, remaining almost the same rejection power (Table 12). Therefore, in accordance with the evidence provided, it is suggested that the potential effect of firm age do not affect the main empirical results, and the same argument that only comprehensive disclosure on compensation lead to higher market value is supported.

Table 12 The Effects of Firm Age as Another Regressor

Panel A The Valuation Regression of Comprehensive Disclosure

This table presents the estimated coefficients from the following regression models.

Model I: $Q_i = \alpha_1 + \delta^1 CP_i + \beta_1^1 SIZE_i + \beta_2^1 DEBT_i + \beta_3^1 INVST_i + \beta_4^1 FCF_i + \beta_5^1 ROA_i + \beta_6^1 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^1$

Model II: $Q_i = \alpha_2 + \delta^2 DCP_i + \beta_1^2 SIZE_i + \beta_2^2 DEBT_i + \beta_3^2 INVST_i + \beta_4^2 FCF_i + \beta_5^2 ROA_i + \beta_6^2 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^2$

Model III: $Q_i = \alpha_3 + \delta^3 ECP_i + \beta_1^3 SIZE_i + \beta_2^3 DEBT_i + \beta_3^3 INVST_i + \beta_4^3 FCF_i + \beta_5^3 ROA_i + \beta_6^3 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^3$

	Model I		Model II		Model III	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
AGE	0.041	1.40	0.041	1.38	0.041	1.39
CP	0.116	4.37 ***	–	–	–	–
DCP	–	–	0.100	3.59 ***	–	–
ECP	–	–	–	–	0.115	4.33 ***
SIZE	-0.010	-0.90	-0.010	-0.93	-0.009	-0.90
DEBT	-0.001	-1.54	-0.001	-1.57	-0.001	-1.55
INVST	-0.002	-2.15 **	-0.002	-2.11 **	-0.002	-2.15 **
FCF	0.007	5.71 ***	0.007	5.73 ***	0.007	5.71 ***
ROA	0.026	9.89 ***	0.026	9.90 ***	0.026	9.90 ***
EPS	0.079	9.89 ***	0.079	9.90 ***	0.079	9.89 ***
Constant	1.201	7.35 ***	1.213	7.41 ***	1.201	7.35 ***
adj. R^2	0.290		0.289		0.290	
MSE	0.59		0.59		0.59	
Obs.	5259		5259		5259	

Panel B The Valuation Regression of Comprehensive and Medium Disclosure

This table presents the estimated coefficients from the following regression model.

Model IV: $Q_i = \alpha_1 + \delta_2^1 CP_i + \delta_2^1 MD_i + \beta_1^1 SIZE_i + \beta_2^1 DEBT_i + \beta_3^1 INVST_i + \beta_4^1 FCF_i + \beta_5^1 ROA_i + \beta_6^1 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^1$

Model V: $Q_i = \alpha_2 + \delta^2 DCP_i + \delta_2^2 DMD_i + \beta_1^2 SIZE_i + \beta_2^2 DEBT_i + \beta_3^2 INVST_i + \beta_4^2 FCF_i + \beta_5^2 ROA_i + \beta_6^2 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^2$

Model VI: $Q_i = \alpha_3 + \delta^3 ECP_i + \delta_2^3 EMD_i + \beta_1^3 SIZE_i + \beta_2^3 DEBT_i + \beta_3^3 INVST_i + \beta_4^3 FCF_i + \beta_5^3 ROA_i + \beta_6^3 EPS_i + \beta_7^1 AGE_i + \varepsilon_i^3$

	Model IV		Model V		Model VI	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
AGE	0.042	1.41	0.042	1.41	0.042	1.41

CP	0.146	3.93 ***	–	–	–	–
MD	0.053	1.16				
DCP	–	–	0.133	2.97 ***	–	–
DMD	–	–	0.048	0.93	–	–
ECP	–	–	–	–	0.145	3.89 ***
EMD	–	–	–	–	0.052	1.14
SIZE	-0.009	-0.87	-0.010	-0.91	-0.009	-0.86
DEBT	-0.001	-1.53	-0.001	-1.55	-0.001	-1.53
INVST	-0.002	-2.13 **	-0.001	-2.08 **	-0.002	-2.12 **
FCF	0.007	5.66 ***	0.007	5.70 ***	0.007	5.66 ***
ROA	0.026	9.93 ***	0.026	9.92 ***	0.026	9.93 ***
EPS	0.079	9.88 ***	0.079	9.89 ***	0.079	9.87 ***
Constant	1.163	6.99 ***	1.175	6.97 ***	1.163	6.98 ***
adj. R^2		0.290		0.289		0.290
MSE		0.59		0.59		0.59
Obs.		5259		5259		5259

Panel C The Disclosure Regression

This table presents the estimated coefficients from the following regression model.

$$CP_i = \alpha + \mathbf{Z}_i \underset{\sim}{\gamma} + \beta_1 SIZE_i + \beta_2 DEBT_i + \beta_3 INVST_i + \beta_4 FCF_i + \beta_5 ROA_i + \beta_6 EPS_i + \beta_7 AGE_i + \eta_i$$

	Model VII		Model VIII	
	Coefficient	t-statistic	Coefficient	t-statistic
AGE	-0.135	-1.35	-0.083	-1.51
%DTF	0.035	2.22	–	–
%OF	0.024	2.20	–	–
%MNG	0.006	0.35	–	–
%CD	-0.002	-0.86	–	–
%CC	0.002	0.35	–	–
%FF	0.000	-0.08 **	–	–
%FU	-0.002	-0.87 **	–	–
OCD	–	–	0.006	1.40
OCS	–	–	0.006	2.07 **
OFS	–	–	0.016	1.91 *
FCD	–	–	-0.003	-3.28 ***
BSIZE	–	–	0.000	0.09
SIZE	-0.064	-1.93 *	0.026	1.28
DEBT	0.001	0.41	-0.002	-1.58
INVST	0.002	0.93	0.002	1.45
FCF	0.006	1.46	-0.003	-1.31
ROA	-0.005	-0.71	0.008	1.83 *
EPS	0.023	0.85	-0.017	-1.36
Constant	2.726	5.02 ***	0.828	2.65 ***
p-value	<0.01		<0.01	
Obs.	5259		5259	

Notes:

[a] If the firm voluntarily provides comprehensive disclosure not only on the level of compensation paid to its executives, but also on the level of compensation paid to its directors, then the compensation disclosure variable, *CP*, takes the value of 1, otherwise 0. Firm age is the natural log of the age of firm (*AGE*). The control variables include the proportion of shares owned by domestic trust funds (%*DTF*), the proportion of shares owned by outside funds (%*OF*), the proportion of shares owned by managers (%*MNG*), the proportion of shares owned by controlling directors (%*CD*), the critical controlling shareholding (%*CC*), the proportion of shares owned by family funds (%*FF*), the proportion of shares owned by family unlisted corporations (%*FU*), the proportion of directors appointed by outside listed corporations (*OCD*), the proportion of supervisors appointed by outside listed corporations (*OCS*), the proportion of supervisors appointed by outside funds (*OFS*), the proportion of directors appointed by family unlisted corporations (*FCD*) and the size of the board (*BSIZE*), firm size (*SIZE*) measured by the natural log of total assets, debt ratio (*DEBT*) measured by the ratio of total liabilities to total assets, proprietary ratio (*INVST*) measured by the ratio of total investment to total assets, free cash flow (*FCF*) measured by the ratio of operating cash flow to total assets, return on assets (*ROA*) and earnings per share (*EPS*).

[c] *** indicates significance at the 1% level; ** indicates significance at the 5% level; and * indicates significance at the 10% level.

Our empirical evidence provides support for the argument of a greater need for comprehensive disclosure of information on compensation (Muslu, 2009; Morse et al., 2010). The evidence on medium levels of disclosure suggests that although information is provided in excess of the mandatory requirement, the camouflaging of compensation contracts may also provide a signal of actions which may be detrimental to shareholder wealth. It therefore seems that only comprehensive disclosure provides a signal of better governance mechanisms, leading to positive effects on market value. Nevertheless, improvements in compensation disclosure by non-electronics firms, generally regarded as having weaker governance mechanisms, also appear to bring higher market value, regardless of the level of transparency. Our findings of the significant (insignificant) effects of comprehensive (medium) disclosure are in line with the argument that comprehensive disclosure is the only level of transparency which can enhance governance mechanisms. The evidence may well be applicable to other emerging markets currently going through disclosure policy reforms, particularly those in which the authorities have refrained from making compensation disclosure compulsory.

5. CONCLUSIONS

The dissertation is set out to examine the market value of comprehensive disclosure of information on compensation using data on Taiwanese firms covering the years 1996 to 2008, a period during which the authorities in Taiwan provided firms with discretion with regard to the level of transparency provided in their compensation disclosure. Our results highlight the significantly positive effect of comprehensive disclosure on the market value of a firm, particularly for those firms with relatively weak governance mechanisms. However, comprehensive disclosure provided by firms which use large proportions of stock bonuses does not provide such higher market valuation. Using the Heckman model to control for potential problems of endogeneity and self-selection bias, the evidence further finds that firms with greater board independence tend to provide comprehensive disclosure of information on compensation, which thereby leads to significantly higher market value. It is also found that compensation disclosure involving only medium levels of transparency is of very little help to the creation of market value.

Our empirical results contribute to this line of research by providing a much broader understanding of compensation disclosure. The main findings suggesting that comprehensive disclosure of information on compensation provides a signal that the firm has fewer agency problems and a better governance structure, whilst non-comprehensive disclosure is perceived as signaling the camouflaging of excess compensation and bargaining behavior. Furthermore, the significant effects of disclosure on the compensation received by directors indicate that investors are concerned not only with executive compensation, but also with whether the compensation paid to directors provides appropriate incentives capable of enhancing the functions of the board. Taken together, the evidence provides general support for the suggestion within the extant literature on corporate governance of the need for

overall improvements in compensation disclosure.

Our evidence may have several applications for other emerging markets. Since most firms seem to prefer partial disclosure, and since those firms with better governance structures are more likely to voluntarily provide comprehensive disclosure, this provides the authorities in other emerging markets with strong motivation to allow firms some discretion in their voluntary reporting of disclosure information. Our sub-sample analysis reveals poor current levels of disclosure on specific compensation information provided by firms, particularly information which investors need to take into account; thus, the market value of compensation disclosure is no longer apparent. The disclosure requirement should therefore be enhanced by enlarging the disclosure items, or the narrative discussion, and by developing more effective enforcement policies. The results of our selection model indicate that the adoption of comprehensive disclosure is non-random. Therefore, improving board independence and overall governance mechanisms can help to increase the willingness amongst firms to provide voluntary disclosure. Whilst voluntary disclosure is desirable, comprehensive disclosure is more likely to be effectively provided under sound disclosure practices, with the application of gradual pressure.

This main empirical result in this study that higher market value of a firm can be created by disclosing comprehensive information has been discussed in previous sections from the perspective of agency theory. It suggests that comprehensive disclosure of compensation information could lower the information asymmetry, further leading to reduction in agency problems between managers and shareholders or the conflicts between directors and minority shareholders. From the perspective of strategic analysis, however, comprehensive disclosure of compensation would provide not only with transparency beneficial to a firm, but also with information that may be harmful to

its strategic development. The compensation disclosure may provide information not only on how the directors and executives of the firm are paid compared with others in the labor market, but also on the signal of competitiveness of business strategies in the future. Therefore, the question of whether comprehensive disclosure of compensation brings only benefits without any additional cost or harm to the firms remains controversial. Future extension can focus on the controversial issue to examine whether there is any non-linear association between higher transparency level of compensation disclosure and firm value.

One of the potential extensions could use current settings to examine the effect on other operating performances (i.e. ROE, ROA or EPS) and costs of capital, both are the unexplored mechanisms through which the market value of a firm is affected by compensation disclosure. In addition, another extension is to examine the short-run effect of compensation disclosure announcement. If the data on filing time of specific disclosure date can be acquired, the event study may provide more insights by examining the effect of transparency level of compensation disclosure on cumulative abnormal returns during the announcement periods.

In addition, the addition of other regressors could also improve the understanding of this line of research. For example, it may be preferable, if the data can be acquired, to control several potential influences, such as the disclosure on compensation of other companies in the same industry, the inclusion or exclusion of other indices of other operating performance, the equity-based or options-based compensation paid to directors and executives, quality and effectiveness of sub-committees on the board, or other governance-related variables.

Some of the narrative statements on compensation information provide several indices or ratios with regard to the compensation paid to directors and executives. In the

future research, some of the informative disclosure of narrative discussion on compensation (such as the indices of pay for performance) could be further quantified for further examination. Although the coding system for clear cut between comprehensive and medium disclosures is convenient for the research experiment, it also raises another potential problem that such coding procedure may be subjective. For example, some of the disclosures in the tables are presented as a dash "–", and it is taken as non-disclosure in this study. The question of whether such information is suitable to be classified as "0" or "non-disclosure" is hard to be identified. One of the potential resolutions is to provide a consecutive score index to rank the level of transparency on compensation disclosure.

REFERENCES

1. Aboody, D. (1996), 'Market Valuation of Employee Stock Options', *Journal of Accounting and Economics*, Vol. 22, Nos. 1-3, pp. 357-391.
2. Ade-Ajayi, F. (2004), 'International Corporate Governance and the Responsibility of the Brand', *Corporate Governance: An International Review*, Vol. 12, No. 2, pp. 184-190.
3. Akbar, S. and A. W. Stark (2003), 'Deflators, Net Shareholder Cash Flows, Dividends, Capital Contributions and Estimated Models of Corporate Valuation', *Journal of Business Finance & Accounting*, Vol. 30, Nos. 9-10, pp. 1211-1233.
4. Akerlof, G. A. and W. T. Dickens (1982), 'The Economic Consequences of Cognitive Dissonance', *American Economic Review*, Vol. 72, No. 3, pp. 307-319.
5. Aksu, M. and A. Kosedag (2006), 'Transparency and Disclosure Scores and Their Determinants in the Istanbul Stock Exchange', *Corporate Governance: An International Review*, Vol. 14, No. 4, pp. 277-296.
6. Andjelkovic, A., G. Boyle and W. McNoe (2002), 'Public Disclosure of Executive Compensation: Do Shareholders Need to Know', *Pacific-Basin Finance Journal*, Vol. 10, No. 1, pp. 97-117.
7. Balata, P. and G. Breton (2005), 'Narrative vs Numbers in the Annual Report: Are They Giving the Same Message to the Investors?', *Review of Accounting and Finance*, Vol. 4, No. 2, pp. 5-25.
8. Bannister, J. W. and H. A. Newman (2006), 'Disclosure Biases and in Proxy Performance Graphs: The Influence of Performance and Compensation Committee Composition', *Review of Accounting and Finance,* Vol. 5, No. 1, pp. 30-44.
9. Barako, D. G., P. Hancock and H. Y. Izan (2006), 'Factors Influencing Voluntary

Corporate Disclosure by Kenya Companies', *Corporate Governance: An International Review*, Vol. 14, No. 2, pp. 107-125.

10. Barry, C. B. and S. J. Brown (1986), 'Limited Information as a Source of Risk', *Journal of Portfolio Management*, Vol. 12, No. 2, pp. 66-72.
11. Barth, M. E., M. B. Clement, G. Foster and R. Kasznik (1998), 'Brand Values and Capital Market Valuation', *Review of Accounting Studies*, Vol. 3, No. 1, pp. 41-68.
12. Bebchuk, L. A. and J. M. Fried (2003), 'Executive Compensation as an Agency Conflict', *Journal of Economic Perspectives*, Vol. 17, No. 3, pp. 71-92.
13. Beekes, W. and P. Brown (2006), 'Do Better Governed Australian Firms Make More Informative Disclosures', *Journal of Business Finance & Accounting*, Vol. 33, Nos. 3-4, pp. 422-450.
14. Blalock, H. M. Jr. (1964), *Causal Inferences in Non-experimental Research*. Chapel Hill: University of North.
15. Botosan, C. A. and M. A. Plumlee (2002), 'A Re-examination of Disclosure Level and the Expected Cost of Equity Capital', *Journal of Accounting Research*, Vol. 40, No. 1, pp. 21-40.
16. Brick, I. E., O. Palmon and J. K. Wald (2006), 'CEO Compensation, Director Compensation, and Firm Performance: Evidence of Cronyism', *Journal of Corporate Finance*, Vol. 12, No. 3, pp. 403-423.
17. Bushee, B. J. and C. F. Noe (2000), 'Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility', *Journal of Accounting Research*, Vol. 38, No. 3, pp. 171-202.
18. Bushee, B. J. and C. Leuz (2005), 'Economic Consequences of SEC Disclosure Regulation: Evidence from the OTC Bulletin Board', *Journal of Accounting and*

Economics, Vol. 39, No. 2, pp. 233-264.

19. Bushman, R. M. and A. J. Smith (2001), 'Financial Accounting Information and Corporate Governance', *Journal of Accounting and Economics*, Vol. 32, Nos. 1-3, pp. 237-333.
20. Byrd, J. W., M. F. Johnson and A. L. Porter (1998), 'Discretion in Financial Reporting: The Voluntary Disclosure of Compensation Peer Groups in Proxy Statement Performance Graphs', *Contemporary Accounting Research*, Vol. 15, No. 1, pp. 25-52.
21. Cahan, S. F., S. M. Courtenay, P. L. Gronewoller and D. R. Upton (2000), 'Value Relevance of Mandated Comprehensive Income Disclosures', *Journal of Business Finance & Accounting*, Vol. 27, Nos. 9-10, pp. 1273-1301.
22. Cerbioni F. and A. Parbonetti (2007), Exploring the Effects of Corporate Governance on Intellectual Capital Disclosure: An Analysis of European Biotechnology Companies, *European Accounting Review*, Vol. 16, No. 4, pp. 791-826.
23. Certo, S. T., C. M. Daily and D. R. Dalton (2001), 'Signaling Firm Value through Board Structure: An Investigation of Initial Public Offerings', *Entrepreneurship: Theory and Practice*, Vol. 26, No. 2, pp. 33-50.
24. Chen, C. Y. (2003), 'Investment Opportunities and the Relation between Equity Value and Employees' Bonus', *Journal of Business Finance & Accounting*, Vol. 30, Nos. 7-8, pp. 941-973.
25. Chen, S., X. Chen and Q. Cheng (2008), 'Do Family Firms Provide More or Less Voluntary Disclosure', *Journal of Accounting Research*, Vol. 46, No. 3, pp. 499-536.
26. Chen, K. C., W. Z. Chen and K. C. J. Wei (2004), 'Disclosure, Corporate

Governance, and the Cost of Equity Capital: Evidence from Asia's Emerging Markets', Working Paper (Hong Kong University of Science & Technology).

27. Chen, S. M. L. DeFond and C. W. Park (2002), 'Voluntary Disclosure of Balance Sheet Information in Quarterly Earnings Announcements', *Journal of Accounting & Economics*, Vol. 33, No. 2, 229-251.

28. Christensen, P. O. and G. A. Feltham (2000), 'Market Performance Measures and Disclosure of Private Management Information in Capital Markets', *Review of Accounting Research*, Vol. 5, No. 4, pp. 301-329.

29. Cohan, J. A. (2002), '"I Don't Know" and "I Was Only Doing My Job": Has Corporate Governance Careened Out of Control? A Case Study of Enron's Information Myopia', Journal of Business Ethics, Vol. 40, No. 3, pp. 275-299.

30. Coles, J. L. (2008), 'Disclosure Policy: A Discussion of Leuz, Triantis and Wang (2008), on "Going Dark"', *Journal of Accounting and Economics*, Vol. 45, Nos. 2-3, pp. 1-12.

31. Collett, P. and S. Hrasky (2005), 'Voluntary Disclosure of Corporate Governance Practices by Listed Australian Companies', *Corporate Governance: An International Review*, Vol. 13, No. 2, pp. 188-196.

32. Conyon, M. J. (2001), 'The Disclosure of UK Boardroom Pay: the March 2001 DTI Proposals', *Corporate Governance: An International Review*, Vol. 9, No. 4, pp. 276-285.

33. Conyon, M. J. and G. V. Sadler (2001), 'CEO Compensation, Option Incentives, and Information Disclosure', *Review of Financial Economics*, Vol. 10, No. 3, pp. 251-277.

34. Cooper, D. W. and B. Grinder (1996), 'Voluntary Information Disclosure during Periods of Stock Price Vulnerability', *Journal of Business Finance & Accounting*,

Vol. 23, No. 3, pp. 461-472.

35. Core, J. E. (2001), 'A Review of the Empirical Disclosure Literature: Discussion', *Journal of Accounting and Economics*, Vol. 31, Nos. 1-3, pp. 441-456.

36. Core, J. E., R. W. Holthausen and D. F. Larcker (1999), 'Corporate Governance, Chief Executive Officer Compensation, and Firm Performance', *Journal of Financial Economics*, Vol. 51, No. 3, pp. 371-406.

37. Craighead, J., M. Magnan and L. Thorne (2000), 'An Investigation of Mandated Compensation Disclosure as a Corporate Governance Mechanism', Working Paper (McGill University).

38. Cubbin, J. and D. Leech (1983), 'The Effect of Shareholding Dispersion on the Degree of Control in British Companies: Theory and Measurement', *Economic Journal*, Vol. 93, No. 370, pp. 351-369.

39. Dalton, D. R., J. L. Johnson and A. E. Ellstrand (1999), 'Number of Directors and Financial Performance: A Meta-analysis', *Academy of Management Journal*, Vol. 42, No. 6, pp. 674-686.

40. Diekmann, K. A. (1997), 'Implicit Justifications' and Self-serving Group Allocations', *Journal of Organizational Behavior*, Vol. 18, No. 1, pp. 3-16.

41. Doidge, C., G. A. Karolyi and R. M. Stulz (2004), 'Why are Foreign Firms Listed in the U.S. Worth More', *Journal of Financial Economics*, Vol. 71, No. 2, pp. 205-238.

42. Durnev, A. and E. H. Kim (2005), 'To Steal or Not to Steal: Firm Attributes, Legal Environment, and Valuation', *Journal of Finance*, Vol. 60, No. 3, pp. 1461-1493.

43. Easley D. and M. O'hara (2004), Information and Cost of Capital, *Journal of Finance*, Vol. 59, No. 4, pp. 1553-1583.

44. Elliott, R. K. and P. D. Jacobson (1994), 'Costs and Benefits of Business Information Disclosure', *Business Horizons*, Vol. 8, No. 4, pp. 80-96.

45. Fox, M. B. (1999), 'Required Disclosure and Corporate Governance', *Law and Contemporary Problems*, Vol. 62, No. 3, pp. 113-127.

46. Frantz, P. and N. Instefjord (2006), 'Voluntary Disclosure of Information in a Setting in which Endowment of Information has Productive Value', *Journal of Business Finance & Accounting*, Vol. 33, Nos. 5-6, pp. 793-815.

47. Gelb, D. S. and P. Zarowin (2002), 'Corporate Disclosure Policy and the Informativeness of Stock Prices', *Review of Accounting Research*, Vol. 7, No. 1, pp. 33-52.

48. Gordon, J. N. (2005), 'Executive Compensation: If There's a Problem, What's the Remedy? The Case for Compensation Disclosure and Analysis', *Journal of Corporation Law*, Vol. 30, No. 3, pp. 675-702.

49. Gordon, J. N., T., M. Fischer, D. Malone and G. Tower (2002), 'A Comparative Empirical Examination of Extent of Disclosure by Private and Public Colleges and Universities in the United States', *Journal of Accounting and Public Policy*, Vol. 21, No. 3, pp. 235-275.

50. Green, J. P., A. W. Stark and H. M. Thomas (1996), 'UK Evidence on the Market Valuation of Research and Development Expenditures', *Journal of Business Finance & Accounting*, Vol. 23, No. 2, pp. 191-216.

51. Guo, R. J., B. Lev and N. Zhou (2004), 'Competitive Costs of Disclosure by Biotech IPOs', *Journal of Accounting Research*, Vol. 42, No. 2, pp. 319-355.

52. Hallock, K. F. (1997), 'Reciprocally Interlocking Boards of Directors and Executive Compensation', *Journal of Financial and Quantitative Analysis*, Vol. 33, No. 3, pp. 331-344.

53. Healy, P. M., A. P. Hutton and K. G. Palepu (1999), 'Stock Performance and Intermediation Changes Surrounding Sustained Increases in Disclosure', *Contemporary Accounting Research*, Vol. 16, No. 3, pp. 485-520.

54. Healy, P. M. and K. G. Palepu (2001), 'Information Asymmetry, Corporate Disclosure, and the Capital Markets: A Review of the Empirical Literature', *Journal of Accounting and Economics*, Vol. 31, Nos. 1-3, pp. 405-440.

55. Healy, P. M. and K. G. Palepu (2003), 'The Fall of Enron', *Journal of Economic Perspectives*, Vol. 17, No. 1, pp. 3-26.

56. Heckman, J. J. (1979), 'Sample Selection Bias as a Specification Error', *Econometrica*, Vol. 47, No. 1, pp. 153-161.

57. Henry, D. (2008), 'Corporate Governance Structure and the Valuation of Australian Firms: Is There Value in Ticking the Boxes', *Journal of Business Finance & Accounting*, Vol. 35, Nos. 7-8, pp. 912-942.

58. Hill, J. (1997), 'Remuneration Disclosure in Australia and the United States', *Corporate Governance: An International Review*, Vol. 5, No. 2, pp. 60-66.

59. Ho, S. S. M. and K. S. Wang (2001), 'A Study of the Relationship between Corporate Governance Structures and the Extent of Voluntary Disclosure', *Journal of Accounting, Auditing and Taxation*, Vol. 10, No. 2, pp. 139-156.

60. Holland, J. (1998), 'Private Voluntary Disclosure, Financial Intermediation and Market Efficiency', *Journal of Business Finance & Accounting*, Vol. 25, Nos. 1-2, pp. 29-68.

61. Hossain, M., K. Ahmed and J. M. Godfrey (2005), 'Investment Opportunity Set and Voluntary Disclosure of Prospective Information: A Simultaneous Equations Approach', *Journal of Business Finance & Accounting*, Vol. 32, Nos. 5-6, pp. 871-907.

62. Hosseini H. (1997), 'Cognitive Dissonance as a Means of Explaining Economics of Irrationality and Uncertainty', *Journal of Socio-Economics*, Vol. 26, No. 2, pp. 181-189.

63. Hribar, P. (2004), 'Discussion of Competitive Costs of Disclosure by Biotech IPOs', *Journal of Accounting Research*, Vol. 42, No. 2, pp. 357-364.

64. Huddart, S., J. S. Hughes and M. Brunnermeier (1999), 'Disclosure Requirements and Stock Exchange Listing Choice in an International Context', *Journal of Accounting and Economics*, Vol. 26, Nos. 1-3, pp. 237-269.

65. Jensen, M. C. (1993), 'The Modern Industrial Revolution, Exit, and the Failure of Internal Control Systems', *Journal of Finance*, Vol. 48, No. 3, pp. 831-880.

66. Jensen, M. C. and K. J. Murphy (1990), 'Performance Pay and Top-Management Incentives', *Journal of Political Economy*, Vol. 98, No. 2, pp. 225-264.

67. Karamanou, I. and G. P. Nishiotis (2009), 'Disclosure and the Cost of Capital: Evidence from the Market's Reaction to Firm Voluntary Adoption of IAS', *Journal of Business Finance & Accounting*, Vol. 36, No. 7-8, pp. 793-821.

68. Khanna, T., K. Palepu and S. Srinivasan (2004), 'Disclosure Practices of Foreign Companies Interacting with US Markets', *Journal of Accounting Research*, Vol. 42, No. 2, pp. 475-508.

69. Korn, E. and U. Schiller (2003), 'Voluntary Disclosure of Nonproprietary Information: A Complete Equilibrium Characterization', *Journal of Business Finance & Accounting*, Vol. 30, No. 9-10, pp. 1327-1339.

70. Laksmana, I. (2008), 'Corporate Board Governance and Voluntary Disclosure of Executive Compensation Practices', *Contemporary Accounting Research*, Vol. 25, No. 4, pp. 1147-1182.

71. Lang, M. and R. Lundholm (2000), 'Voluntary Disclosure and Equity Offerings:

Reducing Information Asymmetry or Hyping the Stock', *Contemporary Accounting Research*, Vol. 17, No. 4, pp. 623-663.

72. Lapointe-Antunes, P., D. Cormier, M. Magnan and S. Gay-Angers (2006), 'On the Relationship between Voluntary Disclosure, Earnings Smoothing and the Value-Relevance of Earnings: The Case of Switzerland', *European Accounting Review*, Vol. 15, No. 4, 465-505.
73. Leftwich, R. (1980), 'Market Failure Fallacies and Accounting Information', *Journal of Accounting and Economics*, Vol. 2, No. 3, pp. 193-211.
74. Leuz, C. and R. E. Verrecchia (2000), 'The Economic Consequences of Increased Disclosure', *Journal of Accounting Research*, Vol. 38, No. 3, pp. 91-124.
75. Lo, K. (2003), 'Economic Consequences of Regulated Changes in Disclosure: The Case of Executive Compensation', *Journal of Accounting and Economics*, Vol. 35, No. 3, pp. 285-314.
76. Lundholm R. and L. A. Myers (2002), 'Bringing the Future Forward: The Effect of Disclosure on the Returns-earnings Relation', *Journal of Accounting Research*, Vol. 40, No. 3, pp. 809-839.
77. Makhija, A. K. and J. M. Patton (2004), 'The Impact of Firm Ownership Structure on Voluntary Disclosure: Empirical Evidence from Czech Annual Reports', *Journal of Business*, Vol. 77, No. 3, pp. 457-491.
78. Mallin, C. (2002), 'The Relationship between Corporate Governance, Transparency and Financial Disclosure', *Corporate Governance*: *An International Review*, Vol. 10, No. 4, pp. 253-255.
79. Morse, A., V. Nanda and A. Seru (2010), 'Are Incentive Contracts Rigged By Powerful CEOs', *Journal of Finance*, Forthcoming.
80. Murphy, K. J. (1996), 'Reporting Choice and the 1992 Proxy Disclosure Rules',

Journal of Accounting, Auditing and Finance, Vol. 11, No. 3, pp. 497-515.

81. Murphy, K. J. (1999), 'Executive Compensation', In: Ashenfelter, O. and D. Card (Eds.), *Handbook of Labor Economics*, Vol. 3b, pp. 2485-2563. (Elsevier Science North Holland).
82. Muslu, V. (2009), 'Executive Directors, Pay Disclosures and Incentive Compensation in Europe', Working Paper, University of Texas at Dallas.
83. Nagar, V., D. Nanda and P. Wysocki (2003), 'Discretionary Disclosure and Stock-based Incentives', *Journal of Accounting and Economics*, Vol. 34, Nos. 1-3, pp. 283-309.
84. Noe, C. F. (1999), 'Voluntary Disclosures and Insider Transactions', *Journal of Accounting and Economics*, Vol. 27, No. 3, pp. 305-326.
85. Ohlson, J. A. (1995), 'Earnings, Book Values, and Dividends in Equity Valuation', *Contemporary Accounting Research*, Vol. 11, No. 2, pp. 661-687.
86. Pagano, M., F. Panetta and L. Zingales (1998), Why Do Companies Go Public? An Empirical Analysis', *Journal of Finance*, Vol. 53, No. 1, pp. 27-64.
87. Parum, E. (2005), 'Does Disclosure on Corporate Governance Lead to Openness and Transparency in How Companies are Managed', *Corporate Governance*: *An International Review*, Vol. 13, No. 5, pp. 702-709.
88. Perotti, E. C. and E. L. Von Thadden (2003), 'Strategic Transparency and Informed Trading: Will Capital Market Integration Force Convergence of Corporate Governance', *Journal of Financial and Quantitative Analysis*, Vol. 38, No. 1, pp. 61-85.
89. Rees, W. P. (1997), 'The Impact of Dividends, Debt and Investment on Valuation Models', *Journal of Business Finance & Accounting*, Vol. 24, Nos. 7-8, pp. 1111-1140.

90. Richardson, A. J. and M. Welker (2001), 'Social Disclosure, Financial Disclosure and the Cost of Equity Capital', *Accounting*, *Organizations and Society*, Vol. 26, No. 7, pp. 597-616.

91. Ryan Jr., H. E. and R. A. Wiggins (2004), 'Who is in Whose Pocket? Director Compensation, Board Independence, and Barriers to Effective Monitoring', *Journal of Financial Economics*, Vol. 73, No. 3, pp. 497-524.

92. Semykina, A. and J. M. Wooldridge (2005), 'Estimating Panel Data Models in the Presence of Endogeneity and Selection: Theory and Application', Working Paper, Michigan State University.

93. Sengupta, P. (1998), 'Corporate Disclosure Quality and the Cost of Debt', *Accounting Review*, Vol. 73, No. 4, pp. 459-474.

94. Setia-Atmaja, L., G. A. Tanewski and M. Skully (2007), 'How do Family Ownership and Control Affect Board Structure, Dividends and Debt? Australian Evidence', Working Paper (Monash University).

95. Soffer, L. C. (1998), 'Discussion of "Discretion in Financial Reporting: The Voluntary Disclosure of Compensation Peer Groups in Proxy Statement Performance Graphs"', *Contemporary Accounting Research*, Vol. 15, No. 1, pp. 53-56.

96. Strong, N. (2000), 'Discussion of Restructuring and Firm Value: The Effects of Profitability and Restructuring Purpose', *Journal of Business Finance & Accounting*, Vol. 27, No. 9-10, pp. 1131-1137.

97. Suijs, J. (2005), 'Voluntary Disclosure of Bad News', *Journal of Business Finance & Accounting*, Vol. 32, No. 7-8, pp. 1423-1435.

98. Vafeas, N. (2000), 'Board Structure and the Informativeness of Earnings', *Journal of Accounting and Public Policy*, Vol. 19, No. 2, pp. 139-160.

99. Van den Berghe, L. A. A. and A. Levrau (2004), 'Evaluating Boards of Directors: What Constitutes a Good Corporate Board', *Corporate Governance*: *An International Review*, Vol. 12, No. 4, pp. 461-478.

100. Verrecchia, R. E. (1983), 'Discretionary Disclosure', *Journal of Accounting and Economics*, Vol. 5, No. 3, pp. 179-194.

101. Ward, M. (1998), 'Director Remuneration: A Gap in the Disclosure Rules', *Corporate Governance: An International Review*, Vol. 6, No. 1, pp. 48-51.

102. Wagenhofer, A. (1990), 'Voluntary Disclosure with a Strategic Opponent', *Journal of Accounting and Economics*, Vol. 12, No. 4, pp. 341-363.

103. Zhou, X. (1999), 'Executive Compensation and Managerial Incentives: A Comparison between Canada and the United States', *Journal of Corporate Finance*, Vol. 5, No. 3, pp. 277-301.

APPENDICES

Table A1 Compensation Disclosure Policy Reforms around the World

Country	*Code of Disclosure*	*Items of Disclosure*
· US · Canada	1. Release No. 33-6962, 57 FR 48126, Ch.17, CFR Parts 228 and 229, *The Executive Compensation Disclosure* (1992) 2. *Compensation Discussion & Analysis* (*CD&A*) (2006)	Comprehensive information on director and executive compensation (Mandatory)
· Taiwan	*Criteria Governing Information to be published in the Annual Reports of Public Companies* (2007)	Comprehensive information on director and executive compensation (Suggested)
· Malaysia	1. Principle B-3 of *the Malaysian Code on Corporate Governance* (2000) Part 1 2. Item (11) of Appendix 9C, Section 9.25 of *the Listing Requirements of Bursa Malaysia Securities Berhad* (2007)	
· Hong Kong	*The Accounting and Auditing Provisions* (2007)	
· India · Australia	*Corporate Governance* (2004) *Clause 49* (*Revised*)	
· UK	1. The Cadbury Code of Best Practice (1993) 2. The Code of Best Practice from the Greenbury Report (1995) 3. *The Directors Remuneration Report Regulations* (2002) 4. *Combined Code on Corporate Governance* (2008)	Levels and structure of executive compensation Policies, performance measures and remuneration of each director
· New Zealand	1. *The Companies Act* (1993) 2. *Finance Act* (1993) *3. Financial Reporting Standards*	Aggregate compensation (since 1993) and other benefits (since 1997)
· South Korea	*The Code of Best Practice for Corporate Governance* (1999)	Remuneration system
· Russia	1. *The Federal Law on Joint Stock Companies*, No. 208-FZ (1995) 2. *The Federal Law on the Securities Market*, No. 39-FZ (1996)	Aggregate compensation and their policies
· China	Item 21-(5) in Chapter III *Periodical Reports of the Regulations on Information Disclosure of Listed Companies* (2007)	Aggregate compensation
· Philippines	*The Code of Corporate Governance* (2002)	

Table A2 Compensation Disclosure Tables

Panel A: Detailed Information on Directors' (Executives') Compensation [a]

Position and name of each director and executive	Directors' remuneration								Subtotal (a+b+c+d)		Employed directors' remuneration										Total (a+b+c+d+e+f+g) ÷ net income		Remuneration from other invested companies and/or subsidiaries
	Fixed remuneration (a)		Pension (b)		Appropriation of earnings (c)		Business entitlement (d)				Remuneration, bonuses and allowances (e)		Pension (f)		Earnings appropriation (g)				Share warrants				
															C		*S*						
	PC	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	*PC*	*CS*	
Chairman																							
Directors [b]																							
CEO																							
Senior Managers																							
⋮																							

Panel B: Levels of Directors' (Executives') Compensation [a]

Level of compensation	Levels of directors' compensation				Levels of executives' compensation	
	PC (a+b+c+d)	CS (a+b+c+d)	PC (a+b+c+d+e+f+g)	CS (a+b+c+d+e+f+g)	PC	CS
Below NT$ 2,000,000						
NT$ 2,000,000~5,000,000						
⋮						

Notes:

[a] Within the gradual process of compensation disclosure policy reforms, there are mandatory requirements for firms to comply with the relevant regulations by disclosing the necessary information once these regulations have been revised. Conversely, voluntary disclosure provides discretions for firms to voluntarily disclose additional information, in excess of the mandatory disclosure requirements, in the tabular forms proposed by the authority. The tables provided in this appendix, and their items, have been revised by the authority several times. These are the latest (2008) versions. *PC* refers to remuneration from the positioned (stand-alone) company; *CS* refers to the total remuneration from the consolidated statements of all companies; *C* refers to cash dividends; and *S* refers to stock dividends.

[b] In accordance with Article 196 of the Company Act, directors are defined as all board members, including standing directors, inside directors, independent (non-executive/supervisory/outside) directors and managing directors.

Curriculum Vita July, 2010

CHIH-LIANG LIU

Contact Information

E-mail: chlliu.bm93g@nctu.edu.tw; chihliangliu@gmail.com;
liuchihliang@hotmail.com; chihliangliu@yahoo.com.tw;

Tel: 886-2-23494975

Fax: 886-2-23494976

Cell Phone: 886 920 073124

Address: Taipei Campus, National Chiao Tung University
No.118, Sec. 1, Chung-Hsiao W. Rd., Taipei 100, Taiwan

Education

Ph.D. in Management, National Chiao Tung University, Taiwan
Aug.2004~Jul.2010

M.A. in Management, National Chiao Tung University, Taiwan
Aug.2002~Jul.2004

B.A. in Management, Tunghai University, Taiwan
Aug.1997~Jul.2002

Research Issues

Issues: Corporate Finance, Corporate Governance, Accounting Transparency, Financial Risk Management, Financial Institutions and Crisis

Quantitative Analysis: Financial Econometrics and Statistical Inference

Software: SAS, MatLab, STATA. EViews

Publications

Comprehensive Disclosure of Compensation and Firm Value: The Case of Policy Reforms in an Emerging Market, Forthcoming in ***Journal of Business Finance & Accounting*** (with Her-Jiun Sheu and Huimin Chung; Rated as an 'A' class journal in finance; SSCI)

Risk-adjusted Compensation Structure in the Banking Industry: The Perspective of 2007-2008 Financial Crisis, *Taiwan Banking & Finance Quarterly*, Vol. 11, No. 2, 2010 (in Chinese; with SouShan Wu and Huimin Chung)

The Credit Risk Pricing with Particle Filter Approach, *IEEE Proceeding on Information Sciences for Computational Intelligence in Economics and Finance*, 2006 (with Her-Jiun Sheu; EI)

Submitted or Working Researches

Corporate Governance and Individual Sensitivity to Market Sentiment (with Huimin Chung)

Board Independence and Family Control (with Her-Jiun Sheu and Huimin Chung)

Risk Contagion during the Crisis: Empirical Modeling from the Modified CoVaR Approach (with Ray-Yeutien Chou and Shin-Feng Yang)

Committee Effectiveness and Banking Performance during the 2007-2008 Financial Crisis: Evidence from a Multi-country Study (with Yin-Hua Yeh and Huimin Chung)

Journal Reviewer

Corporate Governance: An International Review (regular issues and special issue on Corporate Governance in China and India; SSCI)

IEEE Transactions on Evolutionary Computation (SCI)

Conference Session Chair

The 58th Midwest Finance Association (MFA) Annual Meeting, Chicago, USA, 2009.

Conference Discussant

The 2010 Finance and Corporate Governance Conference, Melbourne, Australia
The 2009 Financial Management Association Annual Meeting, Reno, USA
The 2009 Financial Management Association European Conference, Turin, Italy
The 2009 Financial Management Association Asian Conference Xiamen, China
The 58th Midwest Finance Association Annual Meeting, Chicago, USA
The 2009 NTU International Conference on Finance, Taipei, Taiwan

Conference, Workshop and Seminar Presentation

When will Entrenched Family Firms Improve Board Independence, *The 2010 Finance and Corporate Governance Conference*, Melbourne, Australia.

Corporate Governance and Individual Sentiment Beta, *The 2009 Financial Management Association* (**FMA**) *Annual Meeting*, Reno, USA.

Board Independence and Family Control, *The 5th International Symposium of Corporate Governance* (2009), Tianjin, China.

Corporate Governance and Individual Sentiment Beta, *The 2009 Financial Management Association* (**FMA**) *European Conference*, Turin, Italy.

Board Independence and Family Control, *The 2009 Financial Management Association* (**FMA**) *Asian Conference*, Xiamen, China.

Corporate Governance and Individual Sentiment Beta, *The 58th Midwest Finance Association* (**MFA**) *Annual* Meeting (2009), Chicago, USA.

Corporate Governance and Individual Sentiment Beta, *The 2009 NTU International Conference on Finance*, Taipei, Taiwan.

Comprehensive Disclosure of Compensation and Firm Value: The Case of Policy Reforms in an Emerging Market, *The 2009 NCTU International Conference on Quantitative Finance and Risk Management*, Hsinchu, Taiwan.

Corporate Governance and Individual Sentiment Beta, *The 2009 Conference on*

Behavioral Finance and Emerging Markets, Taipei, Taiwan.

Voluntary Comprehensive Compensation Disclosure and the Firm Value: Empirical Evidence from a Capital Market with Revolutionizing Policies, *The 16th Annual Conference on Pacific Basin Finance, Economics, Accounting and Management* (2008), Brisbane, Australia.

The Determinants of Voluntary Disclosure of Directors' Compensation: Empirical Evidence from an Emerging Market, *The 2008 Conference on Behavioral Finance and Emerging Markets*, Taipei, Taiwan.

Options Pricing without Risk Neutral Assumption, *The 2007 Annual Conference on Financial Engineering Association of Taiwan*, Taipei, Taiwan.

The Credit Risk Pricing with Particle Filter Approach, *The 2006 Joint Conference on Information Sciences for Computational Intelligence in Economics and Finance*, Kaoshung, Taiwan.

The Risk Diversification Effect on the Deflated Intertemporal Asset Allocation Model, *The 4th National Conference on Interdisciplinary Management, Theory and* Practice (2006, Taichung, Taiwan.

Teaching Experience

Lecture speech on *Time Series Analysis and Application*. Graduate program of Department of Health Care Management, National Taipei College of Nursing, 2008.

Consulting Service

Consultant for the Infotimes Corporate Governance Database

Working Experiences on Research Program

The Benefits and Improvement in Governance Quality of the Listed Companies Accredited by the Corporate Governance Assessment System
Dec.2009~Jun.2010, Gre-Tai Securities Market, Taipei, Taiwan

The Compensation Structure in Financial Institutions with the Linkage between Risk and Performance
May~Sep.2009, Taiwan Stock Exchange, Taipei, Taiwan

International Portfolio Analysis with the Consideration of Volatility, Spillover Effect and Information Flow
Aug.2007~Jul.2009, National Science Council, Taipei, Taiwan

A Study of the Determinants and Estimation of Default Probability with Firm Specific Factors and Macroeconomic Covariates
Aug.2006~Jul.2007, National Science Council, Taipei, Taiwan

The Development of Oil Futures in Taiwan Market
May~Nov.2006, Taiwan Futures Exchange, Taipei, Taiwan

The Measure of Default Risk and the Factors of Variation in Equity Returns
Aug.2005~Jul.2006, National Science Council, Taipei, Taiwan

The Management Fees of Science Industrial Park
Jun.~Nov.2005, Science Park Administration, National Science Council, Hsinchu, Taiwan.

The Privatization of National Freeway

Jul.2003~Nov.2004, Council for Economic and Development, Taipei, Taiwan

The Comparison of Development in Over the Counter Markets among Japan, Korea and Taiwan and Its Application in Taiwan Market
Nov.2002~Jun.2003, Gre-Tai Securities Market, Taipei, Taiwan

Honors, Grants and Scholarships

The Phi Tau Phi Scholastic Honor (2010), National Chiao Tung University, Hsinchu, Taiwan

Traveling Grant for the Financial Management Association European Conference, Turin, Italy (2009), Granted by National Science Council (Grant number: NSC-98-2922-I-009-024), Taipei, Taiwan

Traveling Grant for the 58th Midwest Finance Association Annual Meeting, Chicago, USA (2009), Granted by Ministry of Education (Grant number: 09D028), Taipei, Taiwan

Traveling Grant for the 16th Annual Conference on Pacific Basin Finance, Economics, Accounting and Management at Brisbane, Australia (2008), Granted by Ministry of Education (Grant number: 08D112), Taipei, Taiwan

Research Scholarship (Sep.2007~Jan.2008) Granted by the Institute of Business and Management, National Chiao Tung University, Taipei, Taiwan

Bert Paper Award of the 4th National Conference on Interdisciplinary Management, Theory and Practice (2006), Tung Hai University, Taichung, Taiwan

The 3rd Scholarship Award of Thesis in Master Degree (2004), Cheng Yung Memorial Foundation, Taipei, Taiwan

Referee

Her-Jiun Sheu (Director)
Professor of Department of Banking and Finance, President of National Chi Nan University
Ph. D. in Administration, New York University
TEL: 886-49-2910272
E-mail: hjsheu@ncnu.edu.tw

Ray-Yeutien Chou (Research Committee)
Research Fellow of Institute of Economics, Academia Sinica
Ph. D. in Economics, University of California at San Diego, USA
TEL: 886-2-27822791 ext: 321
E-mail: rchou@econ.sinica.edu.tw

Huimin Chung (Research Committee)
Professor of Graduate Institute of Finance, National Chiao Tung University
Ph. D. in Economics, Michigan State University, USA
TEL: 886-3-5712121 ext: 57075
E-mail: chunghui@mail.nctu.edu.tw