

The Benefits of Disclosing Internal Control Weaknesses: Evidence from Taiwanese Banks

揭露內部控制缺失之效益：臺灣銀行業之實證

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Abstract

This study uses financial data from banks in Taiwan from 2001 to 2014 to examine the benefits of reporting internal control weaknesses (ICWs). The study argues that reporting non-zero ICWs reveals the high effort undertaken by a firm in assessing its internal control effectiveness and that such effort may be positively valued by the market. The results indicate a strong positive correlation between disclosing non-zero ICWs and market value of equity after controlling endogeneity problems. The results are robust with respect to the additional tests, which include adding other proxies for internal audit quality and considering the effect of mergers and acquisitions. This study is innovative in documenting evidence of the benefits of disclosing ICWs. It contributes to research in this field by supporting regulator's disclosure requirements and encouraging managers to diligently report ICWs.

【Keywords】 internal control weakness, Ohlson model, banks

摘要

依據我國「金融控股公司及銀行業內部控制及稽核制度實施辦法」，銀行業應建立內部控制制度，並確保該制度得以持續有效執行，本研究以2001年至2014年之銀行業為觀察值，探討內部控制缺失揭露之效益。銀行揭露內部控制缺失雖然反映其營運流程有所缺失，但同時也顯示其評估內部控制制度之努力，因而市場可能給予正面評價。在控制內生性之後，內部控制缺失之揭露與銀行股權之市場價值呈現正向關聯，而考量內部稽核品質或銀行併購等因素之可能影響後，實證結果維持不變。本文顯示當銀行努力辨認與揭露內部控制缺失時，投資人認為其努力是有價值的，此結果不僅支持主管機關之揭露政策，也鼓勵經理人誠實報導企業之內部控制缺失。

【關鍵字】 內部控制缺失、Ohlson 模型、銀行業

1. Introduction

The 1992 framework of the Committee of Sponsoring Organization (COSO) indicates that internal controls are designed to provide reasonable assurance regarding the achievement of objectives in the following categories: effectiveness and efficiency of operations, reliability of financial reporting, and compliance with applicable laws and regulations. To ensure that internal control systems functioning appropriately, firms in developed countries are in general required by regulators to assess their internal control effectiveness and provide some form of disclosure regarding any deficiencies or weaknesses revealed by the assessment. Such information is usually referred to as an Internal Control Weakness (ICW) disclosure.

Ogneva, Subramanyam, and Raghunandan (2007) indicate that ICWs can pertain to specific accounting issues (e.g., revenue recognition or inventory accounting) or broader control issues (e.g., adequacy and training of personnel). Hence, extant studies on ICW disclosures generally posit that disclosing ICWs have negative consequences. For example, Ashbaugh-Skaife, Collins, Kinney, and LaFond (2009) find that firms with ICWs have significantly higher idiosyncratic risk, systematic risk, and cost of equity. Dhaliwal, Hogan, Trezevant, and Wilkins (2011) show that, on average, a firm's credit spreads on its publicly traded debt increases marginally if it discloses a material weakness. However, the direct value effect of ICW disclosures remain puzzling. Beneish, Billings, and Hodder (2008) propose that if investors already recognize that ICW-disclosing firms have higher information risk (and hence have discounted stock prices), ICW disclosures are unlikely to be incrementally informative. For firms which disclose at least one ICW, the negative announcement of abnormal returns is significant only for non-accelerated filers but not for accelerated filers. This conclusion is drawn from the fact that accelerated filers operate in richer information environments, so ICW disclosures are less likely to provide investors with incremental information. Li, Yu, Zhang, and Zheng (2016) show that firms which report ICWs have lower Tobin's q values for the period before the disclosures are reported, indicating that the negative effect associated with ICWs is reflected in the equity value prior to the time of disclosure.

This present study focuses on the value effect of disclosing ICWs by using data from banks in Taiwan. Such an investigation is crucial for at least two reasons. First, the value effect directly affects management incentives to report ICWs. Second, the requirement for

regulators to disclose ICWs are further supported if such disclosures facilitate firm valuation. Previously, there are no expectations to find similar results to those documented by prior studies for the following reasons. First, Beneish et al. (2008) use data only from firms that disclose at least one ICW, whereas the data in this study include both firms with zero and non-zero ICWs. It is reasonable that investors view the difference between zero and non-zero ICWs to be more salient than the difference between two non-zero ICWs. Second, both Beneish et al. (2008) and Li et al. (2016) base their analyses on U.S. firms, and the U.S. capital market is considered to be highly efficient. Therefore, in such a mature market, the information in ICW disclosures is more likely to be revealed in advance through other channels, whereas in markets that are less mature, such as in Taiwan, ICW disclosures may still be relevant.

Most importantly, the present study differs from extant literature by being the first to posit that ICW disclosures may be associated with positive value effects, which are interpreted as the benefit of disclosing ICWs. More specifically, it is less reasonable to expect that a firm would have zero ICWs; therefore, when a firm reports zero ICWs, it is reasonable to expect that such firm does not thoroughly assess its internal control effectiveness, and will not have the opportunity to improve its performance as a result. In contrast, when a firm reports non-zero ICWs, it indicates the presence of deficiency, but also suggests that the firm takes the internal control process seriously. In summary, this study presumes that reporting non-zero ICWs reveals higher level efforts in assessing internal control effectiveness and should be positively valued by the market. This argument may appear counterintuitive because it seems more plausible that ICWs should be priced negatively. This study does not refute that possibility, but when a bank reports the presence of ICWs, investors may perceive: (i) the bank has some deficiencies in operations, and (ii) the bank takes the process of identifying and reporting ICWs seriously, i.e., the bank is diligent in internal control processes. The former would negatively affect how investors value the bank, and the latter would positively affect the bank's value. The "net effect" of reporting non-zero ICWs depends on which effect is dominating. If it is empirically found that reporting non-zero ICWs is positively valued by investors, it will correspond with the notion that the benefits of reporting non-zero ICWs outweigh its adverse effects.

The empirical analysis is conducted in the following ways. First, to avoid endogeneity problems, we employ Heckman's two-stage method (Heckman, 1979). In the

first stage, the dependent variable takes a value of 0 if the bank discloses that it has no ICW, or it takes a value of 1 if the bank discloses that it has one or more ICWs. Following previous studies (e.g., Doyle, Ge, and McVay, 2007), ICW is explained by several determinants, including size, age, proxies for financial health, variables capturing the complexity of the operating environment, proxies reflecting the soundness of corporate governance, and a dummy indicating whether the bank's shares are owned by the government.

Second, the application of the Ohlson model is used to examine the value effect of ICW disclosures. Specifically, the market value of equity is explained by the dummy variable equaling 1 if firms disclose non-zero ICWs (denoted as *ICW*), along with the book value, earnings, size, degree of diversification, Z-score, and the inverse Mills ratio from the first stage. This study finds that the coefficient of *ICW* is 0.012, and is statistically significant ($p = 0.018$). Thus, the results indicate that reporting non-zero ICWs is related to positive value effects, consistent with the hypothesis that reporting ICWs reveals the effort of firms in assessing their internal control effectiveness.

Several additional analyses are conducted. First, the study discerns whether the positive value effect of ICW disclosures is influenced when the quality of internal auditing is considered. Specifically, three measures are used as proxies for the quality of internal auditing: whether the internal audit unit directly reports to the board of directors, the log of the number of employees working in the internal audit unit, and the number of meetings in which the internal audit unit holds discussions with the independent directors (or supervisors). The results show that *ICW* remains positively significant when the internal audit quality is controlled. Second, the effects of mergers and acquisitions are considered. Third, the materiality or severity of ICWs is also considered. Fourth, this study follows Cheng, Dhaliwal, and Zhang (2013) in applying propensity score matching as an alternative way to address the endogeneity problem. Lastly, this study also follows Larcker, Richardson, and Tuna (2007) and uses the positive/negative residuals method to mitigate the endogeneity issue. The adjustments above do not affect the main finding that banks disclosing non-zero ICWs are rewarded by the market.

The contributions of this study are described as follows. First, this study is likely the first to investigate the value effect of ICW disclosures by using data from banks in Taiwan. Although prior results regarding the effects of ICW disclosures on the cost of

capital or the quality of financial reporting are insightful, the value effect has a more direct effect on the disclosure policy of management. Because diligently providing disclosures usually incurs considerable costs, management is strongly discouraged from doing so if the market does not consider such disclosures to be relevant. Second, this study is the first to argue and show that ICW disclosures reveal the efforts of firms in assessing their internal control effectiveness and are therefore positively related to the market value of equity. The evidence clearly informs managers that the market appreciates the diligent reporting of ICWs and holds an unfavorable view when no ICWs are identified during an assessment. Third, the evidence supports the regulator's requirement that firms should regularly identify and report ICWs because such disclosures are relevant to investors owing to their clarifying the firms' engagement in improving their performance through internal control systems.

The remainder of this paper proceeds as follows. Section 2 introduces the institutional backgrounds and literature and develops the hypotheses. In Section 3, the research design is explained. Section 4 describes the samples and presents the empirical results. Finally, the conclusions of this study are drawn in Section 5.

2. Institutional Backgrounds, Literature, and Hypothesis Development

Senior executives have long sought methods for increasing the efficiency of controlling the enterprises they run. Internal controls are implemented to promote efficiency, reduce the risk of asset loss, and assist in ensuring the reliability of financial statements and compliance with laws and regulations (COSO, 1992). Numerous corporate scandals in the United States around the turn of the twenty-first century (e.g., Enron, WorldCom, and Tyco) have raised concerns in regards to the quality of financial reporting. Hence, Section 404 of the Sarbanes-Oxley Act (SOX; the section is usually referred to as SOX 404) requires management to annually evaluate internal controls for financial reporting and disclose material weaknesses (usually referred to as ICWs). In Taiwan, the regulators have required banks to regularly provide ICW disclosures in their annual reports since 2001, in accordance with the "Implementation Rules for Bank Internal Audit and Internal Control System" and "Implementation Rules of Internal Audit and Internal

Control System of Financial Holding Companies and Banking Industries.”^{1,2} Related statements are excerpted below.³

For the purpose of self-inspecting an internal control system, a financial holding company (including its subsidiary companies) or a banking business would need to require that all of its internal departments and subsidiaries carry out self-inspection, and have its internal audit unit review the self-inspection reports of each department and subsidiary (including its subsidiary companies if it is a financial holding company); such self-inspection, with the reports on the correction of any deficiencies and irregularities discovered in the internal control system by the internal audit unit, shall serve as a basis for the board of directors, president, chief auditor, and chief compliance officer to evaluate the overall efficacy of the internal control system and to issue internal control system statements. (Article 14)

According to this article, along with a specific ICW, banks should report “the correction” for that ICW (i.e., one or more measures for remedying the disclosed ICWs should be provided). For instance, an ICW disclosed by Taishin International Bank in its 2006 annual report states that the bank holds concerns that the private information of customers might be illegally leaked through outsourced marketing activities. The related measure to remedy such ICW is for the bank to discontinue outsourcing its marketing activities.

Existing studies on ICW disclosures mainly focus on their effect on a firm’s cost of equity or debt. Ogneva et al. (2007) indicates that ICW can pertain to specific accounting issues (e.g., revenue recognition or inventory accounting) or broader control issues (e.g.,

1 “Implementation Rules for Bank Internal Audit and Internal Control System” was issued in 2001 and was replaced by “Implementation Rules of Internal Audit and Internal Control System of Financial Holding Companies and Banking Industries” in 2010.

2 Taiwan also has similar requirements for firms in general industry, stipulated in “Regulations Governing Establishment of Internal Control Systems by Public Companies,” in which Article 14 states that “the internal auditors of a public company shall communicate fully with the audited unit regarding the inspection results of the annual audit items, and shall faithfully disclose in audit reports any defects and irregularities of the internal control systems discovered in [the] assessment.” Nevertheless, the divergence in disclosure practices is considerable. Most firms simply contend that they find no material irregularities of the internal control systems, whereas some firms provide ICW disclosures on an irregular basis. Hence, we focus on data from banks to avoid sample selection bias.

3 In the previous studies (such as Ashbaugh-Skaife et al. (2009) and Dhaliwal et al. (2011), ICWs mandated to SOX 302 or 404 are the internal control weaknesses identified by the management team of the company, and also assured by the certified public accountants. These ICWs are more severe in substance. Comparably, the ICWs in this study reflect the deficiency which banks report in their annual reports. These ICWs may not necessarily result in severe negative consequences.

adequacy and training of personnel). These studies therefore argue that there are at least two reasons to expect a higher cost of equity for ICW-disclosing firms. First, ICWs can result in poor accounting quality, thereby increasing information risk, which has been theoretically and empirically linked to a higher cost of equity. Second, ICWs may be a symptom of poor management controls in general, which can increase business risk and the cost of equity to the extent that the risk is systematic. Empirically, Ogneva et al. (2007) shows that the higher cost of equity associated with ICWs disappears when primitive firm characteristics and analyst forecast bias are controlled. Ashbaugh-Skaife et al. (2009) find that, when other risk factors are controlled, firms with ICWs exhibit significantly higher idiosyncratic risk, systematic risk, and cost of equity. Dhaliwal et al. (2011) test the relationship between the changes in a firm's cost of debt and the disclosure of a material weakness in an initial SOX 404 report. The results indicate that, on average, a firm's credit spread on its publicly traded debt marginally increases when it discloses a material weakness. Similarly, Kim, Song, and Zhang (2011) show that the loan spread is approximately 28 basis points higher for ICW firms than for non-ICW firms. In summary, prior studies provide well-documented evidence regarding the adverse effect of disclosing ICWs on the cost of capital.

Some other studies examine the association between reporting ICWs and financial reporting quality. Feng, Li, and McVay (2009) argue that the quality of internal controls affects the accuracy of internal reports used by managers to form earnings guidance. Hence, they find less accurate guidance among firms reporting ineffective internal controls. Cheng, Yu, and Wang (2012) investigate the relationship between reporting ICWs and discretionary accruals. Their results reveal that, when sample selection bias is controlled, firms that report ICWs have greater absolute discretionary accruals (i.e., lower earnings quality). Tseng, Wang, Wang, and Shiue (2015) note that reporting ICWs is positively related to both real earnings management and discretionary accruals. Chiang, Shiue, and Lo (2015) use the number of sanctions as a proxy for deficiencies in banks' internal control systems and show that banks with more sanctions are associated with poorer earnings quality, as measured by discretionary loan loss provisions.

Relatively few studies evaluate whether disclosing ICWs is related to firm valuation. Beneish et al. (2008) propose that investors who already recognize the information risk is higher within ICW-disclosing firms, and the disclosures are unlikely to provide them with incremental information. They find that the negative abnormal returns around the announcement of ICWs is significant for non-accelerated filers but not for accelerated

filers. Therefore, ICW disclosure is less likely to provide incremental information for accelerated filers, who operate in richer information environments. Similarly, Li et al. (2016) indicate that the negative effect associated with ICWs is reflected in equity value prior to the time of disclosure.

The present study focuses on the effect of ICW disclosures on firm values rather than the cost of capital because the market value of equity is generally considered to incorporate all relevant information (Aaker and Jacobson, 1994; Barth, Beaver, and Landsman, 2001; Paul, 1993). Based on forecast, this study does not expect results to be similar to those reported in previous studies for the following reasons. First, the data Beneish et al. (2008) use are only obtained from firms that disclose at least one ICW; however, the data from this study include both firms with zero and non-zero ICWs. It is reasonable to suggest that investors view the difference between zero and non-zero ICWs to be more salient than the difference between two non-zero ICWs. Second, in studies investigating highly efficient markets, such as the U.S. capital market (Beneish et al., 2008; Li et al., 2016), the information in ICW disclosures is more likely to be revealed in advance through other channels; in contrast, ICW disclosures may still be relevant in a less mature market like Taiwan's stock exchanges.

Moreover, the most innovative aspect of this study is the proposal that ICW disclosures may reveal the degree in which firms take the process of identifying ICWs seriously. Since it is not reasonable to assume that a bank would actually have no ICW,⁴ a bank reporting zero ICW is more likely to have exerted little effort in identifying ICWs. In contrast, reporting non-zero ICWs indicates that the bank has some operation deficiencies, and yet suggests that the bank takes the process seriously, i.e., its effort level is higher. Previous studies indicate that greater management effort is related to improved firm performance (Bonner and Sprinkle, 2002; Bitler, Moskowitz, and Vissing-Jørgensen, 2005), and therefore, when a bank reports the presence of ICWs, investors may perceive the following: (i) the bank has some deficiencies in operations, and (ii) the bank makes substantial efforts in identifying and reporting ICWs. The former would negatively affect how investors value the bank, but the latter would positively affect the bank's value. The

4 The regulator in Taiwan announces bank violations of regulations/laws annually. One particular regulation pertains to the design or implementation of internal control systems. According to Chiang et al. (2015), from 2005 to 2011, 38 of 62 violations were related to ICWs. The ratio is relatively high and also suggests that it is highly unlikely that a bank would actually have no ICWs.

“net effect” of reporting non-zero ICWs depends on which effect is dominating. When a bank reports that it has zero ICW, the first force is zero, but the second force is negative because investors do not believe that a bank would actually have zero ICW, and would interpret such contention as that the bank making little effort in identifying and reporting ICWs. Therefore, the net effect of reporting zero ICW is highly likely to be negative.

In contrast, when a bank reports non-zero ICWs, although investors may perceive the bank is having some deficiencies in operations, and hence value the bank negatively to some degree, investors may also perceive that the bank takes the internal control process seriously, and such effort would benefit the bank in the long run. Therefore, reporting non-zero ICWs may have some positive effects on firm value. The net effect of reporting non-zero ICWs depends on which force is dominating. In sum, it is reasonable to expect that when empirical comparisons are made, banks that report non-zero ICWs are positively valued by investors. The discussions above lead us to hypothesize that disclosing non-zero ICWs is positively valued by the market.⁵

3. Research Design

This study investigates whether ICW disclosures are valued by the market using the Ohlson model. However, the endogenous variable, disclosures of ICW, may cause bias in ordinary least squares (OLS) parameter estimates (Wooldridge, 2002). Hence, Heckman’s two-stage method is used to mitigate the potential selection bias. In the first stage, the study regresses ICW disclosures on a set of determinants for reporting ICWs suggested by prior studies. Specifically, the following Probit model is used for estimation:

$$\begin{aligned} \text{Probit}(ICW_{it}) = & \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 \ln(AGE)_{it} + \alpha_3 AGGLOSS_{it} + \alpha_4 ROA_{it} + \alpha_5 sd(ROA)_{it} \\ & + \alpha_6 DIV_ASSET_{it} + \alpha_7 DIV_REV_{it} + \alpha_8 FOREIGN_{it} + \alpha_9 EXGROWTH_{it} \\ & + \alpha_{10} BDSIZE_{it} + \alpha_{11} BDMGER_{it} + \alpha_{12} BDHD_{it} + \alpha_{13} MGERHD_{it} \\ & + \alpha_{14} MODEV_{it} + \alpha_{15} BDPLEDGE_{it} + \alpha_{16} BLOCKHD_{it} + \alpha_{17} LEGALHD_{it} \\ & + \alpha_{18} GOVHD_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

5 In contrast to Li et al. (2016), who also document some positive valuation implications, we do not impose the restriction that ICWs have a positive valuation effect only when ICWs are remedied. In other words, they view ICW disclosures as negative events that the market reacts positively to when they are remedied. Nevertheless, we propose that ICW disclosures may simultaneously contain both negative and positive information. While the effect of negative information should be included in the assets (or liabilities) related to the specific ICW, no prior study has examined the effect of positive information.

The dependent variable, *ICW*, is equal to 1 when bank *i* discloses a non-zero value of ICWs in year *t*, and 0 otherwise. The construction of Model (1) mainly follows Doyle et al. (2007). First, *SIZE* equals the log of a bank's total assets (in millions) (Chen and Lin, 2010). Larger banks tend to have more employees and therefore are able to have more effectiveness in implementing internal control mechanisms. However, they may engage in more transactions with complex operations, which would increase the possibility of them reporting more ICWs than smaller banks would report. Second, this study includes the age of the bank ($\ln(AGE)$). Older banks are likely to have fewer ICWs because they have established adequate control systems. Three variables are used to control the financial health of banks. Fewer ICWs are expected for banks with stronger financial resources (Doyle et al., 2007). *AGGLOSS* captures the operation loss in two consecutive years. Furthermore, *ROA* and the standard deviation of *ROA*, denoted as $sd(ROA)$, is used to account for the bankruptcy probability (De Nicolo, 2001; Iannotta, Nocera, and Sironi, 2007; Lin, Chang, and Wu, 2014; Tsai, Chang, and Lai, 2009). Higher *ROA* with lower $sd(ROA)$ indicates a lower possibility for a bank to enter bankruptcy. Three other variables, *DIV_ASSET*, *DIV_REV*, and *FOREIGN*, are used to control the complexity of the operating environment of the bank. When banks engage in more complex operating transactions, they are more likely to have more ICWs (Doyle et al., 2007). Following Laeven and Levine (2007), Lin et al. (2014) and Tsai et al. (2009), total profit-generating assets are separated into loans and other profit-generating assets, and then the degree of diversification according to their assets is calculated. *EXGROWTH* controls for the effect of the rapid growth of a bank. A bank with rapid growth may require more time to establish adequate internal control procedures than a bank with stable growth would, and hence it may report more ICWs (Doyle et al., 2007). The detailed variable definitions are presented in the Appendix.

Corporate governance is also expected to be associated with internal control quality (Doyle et al., 2007). This study includes nine corporate governance variables in Model (1). Some previous studies document that smaller boards are related to sounder governance (e.g., Yermack, 1996; Core, Holthausen, and Larcker, 1999), whereas other studies find that board size correlates positively with firm performance (e.g., Dalton, Daily, Johnson, and Ellstrand, 1999). Therefore, this study does not hypothesize what the sign of the coefficient of *BDSIZE* will be. Another characteristic of the board is the independence of the board members. Firms that have boards with more outside directors than inside

directors tend to have less financial statement frauds, resulting in positive outcomes (Beasley, 1996; Klein, 2002). The higher the *BDMGER*, the less independent the board might be. Next, the characteristics of the share ownership of the banks by shares held by directors on the board and managers (*BDHD* and *MGERHD*), the deviation between controlling seats and controlling shares (*MODEV*), and shares pledged by the directors in the board (*BDPLEDGE*) are measured. Separation of ownership and control rights incur agency costs (Jensen and Meckling, 1976). Thus, firm value or performance can be enhanced as management or board ownership increases (e.g., Weisbach, 1988; Mehran, 1995; Bhagat and Bolton, 2008). Nevertheless, Morck, Shleifer, and Vishny (1988) report a nonlinear relationship between firm value and management ownership. As for *BDPLEDGE*, Chiou, Hsiung, and Kao (2002) document that firms with a higher proportion of shares pledged by the directors tend to exhibit poorer operating performance and financial distress. Moreover, this study controls the shares held by blockholders or institutional investors (*BLOCKHD* and *LEGALHD*). Previous studies find that blockholder ownership improves corporate governance effectiveness (e.g., Berle and Means, 1932; Shivdasani, 1993; Kaplan and Minton, 1994). Finally, *GOVHD* is a dummy variable indicating whether the bank's shares are owned by the government (Sapienza, 2004; Iannotta, Nocera, and Sironi, 2013; Onali, Galiakhmetova, Molyneux, and Torluccio, 2016). Model (1) is clustered by years. By performing model (1) this study calculates the inverse Mills ratio (*IMR*) for bank *i*, which will be used in the second stage.

In the second stage, Model (2) is used to examine how the ICW disclosures are related to the market value of equity. The Ohlson model is extensively used to examine the effect of the factor of interest on value relevance (Chen, Chang, Wang, and Lee, 2005; Fan, Lin, and Chen, 2015; Liao and Lee, 2017). This study adopts the Ohlson model (1995) and further includes ICW disclosures and the inverse Mills ratio (*IMR*) calculated from model (1) in the following model.

$$MV_{it} = \beta_0 + \beta_1 ICW_{it} + \beta_2 BV_{it} + \beta_3 NI_{it} + \beta_4 SIZE_{it} + \beta_5 DIV_ASSET_{it} + \beta_6 DIV_REV_{it} + \beta_7 ZSCORE_{it} + \beta_8 IMR_{it} + \varepsilon_{it} \quad (2)$$

MV and BV reflect the market value and net assets of bank i at the end of year t , respectively.⁶ NI equals the net income of bank i in year t . MV , BV , and NI are deflated by total assets at the end of year $t-1$. Moreover, based on Baele, De Jonghe, and Vander Venet (2007) and Guerry and Wallmeier (2017), bank size ($SIZE$), degree of diversification (DIV_ASSET and DIV_REV), and Z-score ($ZSCORE$) are added as the control variables. Furthermore, Model (2) is clustered by years. The hypothesis is that reporting non-zero ICWs is positively valued by the market; therefore, a positive value for β_1 ⁷ is predicted.

4. Empirical Results

4.1 Sample Selection

By correlating the ICW disclosures and bank value, disclosure information, financial and stock price data, and values for the corporate governance variables are required. The ICW disclosures are manually collected from the annual reports of every bank in the sample. Financial data, stock prices, and corporate governance variables are extracted from the *Taiwan Economic Journal (TEJ)* database. In the sample of banks, there are 384 bank-year observations with financial data in the *TEJ* for the 2001–2014 period. This study excludes 35 observations with incomplete financial or corporate governance variables. Furthermore, 208 observations are excluded because their shares are not publicly traded in the stock market. Thus, the final sample comprises 141 observations from 16 banks.⁸ See Table 1 for the sample selection process.

6 The empirical results remain unchanged when we measure the market value at the date of financial statement disclosures.

7 Lennox, Francis, and Wang (2012) indicate that when applying twostage method for the selection models, exclusion restriction is important. In the first stage model, if any variable does not appear as a separate regressor in the second stage model, it is likely to satisfy the exclusion restriction. In our model (1), several variables are excluded from the model (2). Then, Lennox et al. (2012) point out that if the research imposes no exclusion restrictions, usually the model is more likely to suffer from multicollinearity problems. The mean VIF for our model (2) is 1.54, and hence the concern over imposing no exclusion restrictions might be mitigated to some degree.

8 Most banks in Taiwan are owned by financial holding companies, and these banks are not publicly traded. Hence, there are few public banks. By comparing the average total assets, our sample banks account for approximately 70% of all banks. Similarly, the number of public banks in other Asian countries is also low (Bikker and Haaf, 2002; Shen and Chih, 2005). For example, the number of banks in Korea investigated by Bikker and Haaf (2002) is 21, and the number of observations from Thailand in Shen and Chih (2005) is 64 over a 9-year period, indicating an average of nine banks per year.

Table 1 Sample Selection

Process	# of Obs.
Banks that have financial data in TEJ from 2001 to 2014	384
Less: observations with incomplete financial or corporate governance variables	(35)
Less: observations whose shares are not publicly traded	(208)
Final observations	141
Number of banks	16

Table 2 shows the distribution of the sample by year and by the number of ICWs. More than 80% ($n = 113$) of the observations report zero ICWs. Approximately 10% ($n = 14$) of the observations disclose one ICW, and 4% ($n = 5$) and 3% ($n = 4$) report two and three ICWs, respectively. With the decreasing trend, only 1% ($n = 1$) of banks disclose seven ICWs. See Table 2 for the sample distribution.

Table 2 Sample Distribution by Year and Number of Internal Control Weaknesses

year	Number of internal control weaknesses							Total
	0	1	2	3	4	5	7	
2001	1	0	0	0	0	0	0	1
2002	3	1	0	0	0	0	0	4
2003	5	0	0	1	0	0	0	6
2004	8	1	0	0	0	0	0	9
2005	11	0	0	0	0	0	0	11
2006	9	1	1	0	0	0	0	11
2007	9	2	0	0	1	0	0	12
2008	12	1	0	0	0	0	0	13
2009	11	1	0	1	0	0	0	13
2010	10	2	0	1	0	0	0	13
2011	11	1	1	0	0	0	0	13
2012	7	2	1	1	1	0	0	12
2013	8	1	1	0	0	1	1	12
2014	8	1	1	0	1	0	0	11
Total	113	14	5	4	3	1	1	141

4.2 Descriptive Statistics

Panel A of Table 3 shows that the mean value of *SIZE* is 12.815, reflecting New Taiwan Dollars \$574 billion (approximately US\$19 billion) in total assets owned by the banks. The statistics for *AGE* show that the age of the banks ranges from 1 to 66 years, with a mean age of 33 years. Ten percent of the observations report a loss of continuing operations over 2 consecutive years (*AGGLOSS*). The median value of *ROA* is 0.003 and the mean value of the standard deviation of ROA in the previous 3 years, *sd(ROA)*, is 0.005. *DIV_ASSET* is 0.578 on average, indicating a nontrivial difference between loans and other profit-generating assets. The mean value of *DIV_REV* is 0.446, showing that banks are generally fairly diversified when measured on the basis of revenues. Approximately 23% of the observations report extreme sales growth (*EXGROWTH*).

Regarding the corporate governance variables, the original size of the board (*BOD*) ranges from 6 to 21, with 12 directors on average. Furthermore, 10.4% of the managers are also directors on the board (*BDMGER*). Board directors hold 23% of the shares of the banks (*BDHD*). On average, 0.3% of the shares are held by bank managers (*MGERHD*). The mean value of the deviation of management and ownership (*MODEV*) is 2.472, as measured by the ratio of the percentage of controlling seats to the percentage of controlling shares. Regarding the share owners, 16% of the shares of board directors are pledged (*BDPLEDGE*), 23% are held by blockholders of the bank (*BLOCKHD*), and 62% are held by legal persons (*LEGALHD*). Finally, on average, 22% of the observations are partially held by the government (*GOVHD*). The average value of the market value of equity deflated by the lagged total assets (*MV*) is 0.067. Book value deflated by the lagged total assets (*BV*) is 0.076. Net income deflated by the lagged total assets (*NI*) is 0.001. Extreme values of the variables in Table 3 are winsorized at 1%.⁹ Panel B of Table 3 presents the pair-wise difference tests between two groups—banks without and with ICW. Most of the variables appear differ significantly between the two groups at one-tailed significant levels.

9 The results remain unaffected when outliers are removed instead of using the winsorizing method.

Table 3 Descriptive Statistics

Panel A: Descriptive Statistics		N	mean	S.D.	min	p25	p50	p75	max
<i>ICW</i>		141	0.199	0.400	0.000	0.000	0.000	0.000	1.000
<i>SIZE</i>		141	12.815	0.926	10.615	12.220	12.737	13.107	14.829
<i>AGE</i>		141	33.021	21.770	1.000	15.000	22.000	58.000	66.000
<i>AGGLOSS</i>		141	0.099	0.300	0.000	0.000	0.000	0.000	1.000
<i>ROA</i>		141	0.000	0.012	-0.062	0.000	0.003	0.006	0.022
<i>sd(ROA)</i>		141	0.005	0.005	0.000	0.001	0.003	0.007	0.024
<i>DIV_ASSET</i>		141	0.578	0.165	0.245	0.464	0.539	0.684	0.980
<i>DIV_REV</i>		141	0.446	0.219	0.074	0.276	0.401	0.598	0.994
<i>FOREIGN</i>		141	0.433	0.497	0.000	0.000	0.000	1.000	1.000
<i>EXGROWTH</i>		141	0.234	0.425	0.000	0.000	0.000	0.000	1.000
<i>BDSIZE</i>		141	12.319	3.646	6.000	9.000	12.000	15.000	21.000
<i>BDMGER</i>		141	0.104	0.072	0.000	0.067	0.111	0.133	0.333
<i>BDHD</i>		141	0.228	0.177	0.000	0.086	0.159	0.347	1.000
<i>MGERHD</i>		141	0.003	0.003	0.000	0.000	0.001	0.003	0.021
<i>MODEV</i>		141	2.472	1.895	0.560	1.450	1.980	2.610	10.530
<i>BDPLEDGE</i>		141	0.159	0.293	0.000	0.000	0.000	0.124	1.000
<i>BLOCKHD</i>		141	0.231	0.167	0.000	0.115	0.195	0.343	0.863
<i>LEGALHD</i>		141	0.617	0.215	0.091	0.491	0.649	0.751	1.000
<i>GOVHD</i>		141	0.220	0.416	0.000	0.000	0.000	0.000	1.000
<i>MV</i>		141	0.067	0.039	0.022	0.044	0.059	0.073	0.307
<i>BV</i>		141	0.076	0.046	0.028	0.054	0.065	0.081	0.361
<i>NI</i>		141	0.001	0.012	-0.054	0.000	0.003	0.006	0.024
<i>ZSCORE</i>		141	3.905	1.407	1.483	2.678	3.918	4.866	8.248

Note: See Appendix for variable definitions.

Table 3 Descriptive Statistics (continued)

	Panel B: Pair-wise difference tests					
	Banks without ICW (N = 113)		Banks with ICW (N = 28)		Mean difference	Median difference
	Mean	Median	Mean	Median		
<i>SIZE</i>	12.869	12.754	12.596	12.688	0.081	0.129
<i>AGE</i>	34.513	25.000	27.000	19.500	0.051	0.217
<i>AGGLOSS</i>	0.088	0.000	0.143	0.000	0.196	0.195
<i>ROA</i>	0.000	0.003	0.001	0.003	0.338	0.194
<i>sd(ROA)</i>	0.004	0.002	0.007	0.005	0.005	0.008
<i>DIV_ASSET</i>	0.562	0.521	0.642	0.660	0.011	0.011
<i>DIV_REV</i>	0.440	0.398	0.470	0.408	0.260	0.308
<i>FOREIGN</i>	0.434	0.000	0.429	0.000	0.481	0.481
<i>EXGROWTH</i>	0.239	0.000	0.214	0.000	0.392	0.392
<i>BDSIZE</i>	12.593	13.000	11.214	10.500	0.037	0.024
<i>BDMGER</i>	0.111	0.111	0.077	0.080	0.012	0.013
<i>BDHD</i>	0.235	0.159	0.201	0.160	0.178	0.219
<i>MGERHD</i>	0.003	0.001	0.002	0.001	0.057	0.113
<i>MODEV</i>	2.624	2.090	1.862	1.730	0.028	0.002
<i>BDPLEDGE</i>	0.109	0.000	0.364	0.080	0.000	0.003
<i>BLOCKHD</i>	0.201	0.141	0.353	0.329	0.000	0.000
<i>LEGALHD</i>	0.597	0.637	0.697	0.719	0.013	0.011
<i>GOVHD</i>	0.257	0.000	0.071	0.000	0.017	0.017
<i>MV</i>	0.064	0.059	0.078	0.065	0.048	0.078
<i>BV</i>	0.076	0.064	0.076	0.070	0.488	0.111
<i>NI</i>	0.001	0.003	0.002	0.004	0.307	0.191
<i>ZSCORE</i>	4.050	3.976	3.317	2.935	0.007	0.010

Note: See Appendix for variable definitions.

Table 4 shows the correlation coefficients among the variables. Most of the financial and corporate governance variables are found to correlate with ICW disclosures (*ICW*), especially the corporate governance variables. Furthermore, the book value (*BV*) and net income (*NI*) correlate positively with the market value (*MV*) of the bank. The variance inflation factors (*VIF*) among the independent variables do not exceed 10.

Table 4 Correlation Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) <i>ICW</i>	1.00									
(2) <i>SIZE</i>	-0.12	1.00								
(3) <i>ln(AGE)</i>	-0.05	0.63	1.00							
(4) <i>AGGLOSS</i>	0.07	-0.11	-0.11	1.00						
(5) <i>ROA</i>	0.04	0.07	0.10	-0.65	1.00					
(6) <i>sd(ROA)</i>	0.22	-0.21	-0.18	0.41	-0.37	1.00				
(7) <i>DIV_ASSET</i>	0.19	-0.17	-0.22	-0.02	0.26	-0.06	1.00			
(8) <i>DIV_REV</i>	0.05	-0.14	-0.40	-0.19	0.36	-0.14	0.50	1.00		
(9) <i>FOREIGN</i>	0.00	0.32	0.15	-0.05	0.14	-0.07	0.11	0.02	1.00	
(10) <i>EXGROWTH</i>	-0.02	-0.13	-0.21	-0.13	0.15	0.00	0.11	0.24	-0.01	1.00
(11) <i>BDSIZE</i>	-0.15	0.24	0.24	-0.04	-0.13	0.11	-0.48	-0.22	-0.11	0.04
(12) <i>BDMGER</i>	-0.19	0.07	-0.12	0.07	-0.08	0.06	-0.06	0.08	0.02	-0.06
(13) <i>BDHD</i>	-0.08	0.29	0.14	-0.02	-0.05	-0.01	-0.14	-0.14	0.10	-0.04
(14) <i>MGERHD</i>	-0.13	-0.10	0.09	-0.05	0.09	-0.03	-0.15	-0.03	0.07	-0.06
(15) <i>MODEV</i>	-0.16	-0.03	0.14	-0.09	-0.02	0.12	-0.30	-0.16	-0.09	-0.13
(16) <i>BDPLEDGE</i>	0.35	-0.18	-0.18	0.28	-0.13	0.43	0.24	0.14	-0.15	0.07
(17) <i>BLOCKHD</i>	0.36	-0.33	-0.29	0.25	-0.14	0.13	0.42	0.28	-0.02	0.14
(18) <i>LEGALHD</i>	0.19	0.31	-0.22	0.19	-0.14	0.09	0.26	0.25	0.09	0.07
(19) <i>GOVHD</i>	-0.18	0.39	0.37	-0.12	0.03	-0.30	-0.36	-0.33	-0.01	-0.05
(20) <i>MV</i>	0.14	-0.21	-0.14	-0.05	0.27	0.32	0.40	0.44	0.07	0.21
(21) <i>BV</i>	0.00	-0.38	-0.47	-0.04	0.17	0.17	0.32	0.55	-0.18	0.33
(22) <i>NI</i>	0.04	0.04	0.08	-0.62	0.99	-0.35	0.29	0.39	0.13	0.19
(23) <i>ZSCORE</i>	-0.21	0.29	0.17	-0.33	0.32	-0.80	0.20	0.20	0.12	0.05

Note: See Appendix for variable definitions. Coefficients in bold present 10% significance.

(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
1.00												
-0.03	1.00											
0.27	-0.06	1.00										
0.15	0.23	-0.35	1.00									
0.16	0.15	-0.33	0.39	1.00								
-0.04	-0.05	0.16	-0.01	-0.10	1.00							
-0.24	0.10	-0.46	-0.13	-0.31	0.14	1.00						
-0.03	0.27	0.42	-0.48	-0.50	0.34	0.28	1.00					
0.34	-0.03	0.57	-0.22	-0.18	-0.26	-0.44	0.10	1.00				
-0.12	0.11	-0.13	0.02	0.07	0.25	0.25	0.03	-0.35	1.00			
0.03	0.10	-0.23	-0.11	-0.01	0.12	0.42	0.11	-0.34	0.70	1.00		
-0.13	-0.08	-0.07	0.07	-0.02	-0.11	-0.09	-0.13	0.00	0.34	0.25	1.00	
-0.09	0.00	0.12	-0.04	-0.16	-0.29	-0.09	0.06	0.30	-0.15	-0.08	0.31	1.00

4.3 Effects of ICW Disclosures on Bank Value

This study first estimates Model (1) to address the potential endogeneity problem involved in reporting ICW. Table 5 shows the empirical results. The pseudo- R^2 is 39%, indicating that *ICW* can be largely explained by these determinants. The coefficients of *BDPLEDGE*, *BLOCKHD*, and *GOVHD* are all be significantly positive ($p < 0.1$). These results indicate that banks with more shares pledged by board directors, banks with more shares held by blockholders, and banks with government ownership tend to disclose non-zero ICWs. In contrast, the coefficients of *EXGROWTH* and *BDMGER* are significantly negative ($p < 0.1$), indicating that banks with extreme growth and banks with managers on the board are less likely to disclose non-zero ICWs.^{10,11}

Table 6 shows the results of the second stage. The R^2 is 60%, indicating that *MV* can be fairly explained by the independent variables in Model (2). The coefficient of *ICW* is positively significant ($p < 0.05$).¹² Regarding the book value (*BV*) and net income (*NI*), the associated coefficients are positively significant (both $p < 0.1$), as generally documented in the value-relevance literature.

10 Two variables may also be related to the ICW disclosures of banks. *HOLDING* defines whether the bank belongs to a financial holding company. *BIGN* indicates whether the bank is audited by a large accounting firm. In Taiwan, large accounting firms are affiliated with Arthur Andersen, Deloitte Touche Tohmatsu, Ernst & Young, KPMG, and PricewaterhouseCoopers. However, empirically, the two variables do not add incremental explanation and are automatically dropped by the statistical software. Thus, *HOLDING* and *BIGN* are omitted in Model (1).

11 The VIF of the variables in our first stage are all smaller than 10, which indicates there is no multicollinearity problem. However, to be conservative, we eliminate *LEGALHD* because it has high correlation coefficients (approximately 0.5) with three other variables. The main results do not change.

12 Although we add government ownership (*GOVHD*) to our model (1), it is still worth noting the effect of government ownership on our main tests. Hence, we perform the empirical analyses by separating our observations into two groups: government-owned and non-government-owned banks. We find that for non-government-owned banks, the coefficients of ICW disclosure measures are positive and significant, similar to our main findings. For government-owned banks, the coefficients of ICW disclosure measures become less significant. However, the sample size of government-owned banks is 31, which is relatively small, and caution should therefore be taken when interpreting this result.

Table 5 Determinants of Reporting Internal Control Weaknesses

	Dependent variable = <i>ICW</i>			
	Coef.	Std. Err.	z	$p > z$
<i>SIZE</i>	-0.140	0.443	-0.320	0.751
<i>ln(AGE)</i>	0.131	0.317	0.410	0.679
<i>AGGLOSS</i>	-0.971	0.779	-1.250	0.213
<i>ROA</i>	28.912	21.359	1.350	0.176
<i>sd(ROA)</i>	73.578	26.101	2.820	0.005
<i>DIV_ASSET</i>	-2.170	1.463	-1.480	0.138
<i>DIV_REV</i>	-0.702	0.879	-0.800	0.425
<i>FOREIGN</i>	-0.031	0.348	-0.090	0.928
<i>EXGROWTH</i>	-0.484	0.289	-1.680	0.093
<i>BDSIZE</i>	-0.795	0.727	-1.090	0.274
<i>BDMGER</i>	-10.535	3.387	-3.110	0.002
<i>BDHD</i>	-2.778	2.179	-1.270	0.202
<i>MGERHD</i>	0.285	62.412	0.000	0.996
<i>MODEV</i>	0.022	0.116	0.190	0.850
<i>BDPLEDGE</i>	2.042	0.746	2.740	0.006
<i>BLOCKHD</i>	4.574	1.904	2.400	0.016
<i>LEGALHD</i>	2.168	1.762	1.230	0.219
<i>GOVHD</i>	0.884	0.455	1.940	0.052
_cons	2.240	4.773	0.470	0.639
Log likelihood	-43.038			
Number of obs.	141			
Pseudo R ²	0.388			

Note: See Appendix for variable definitions.

Table 6 The Effects of Internal Control Weaknesses Disclosures on Market Values

	Coef.	Std. Err.	<i>t</i>	<i>p</i> > <i>t</i> [#]
<i>ICW</i>	0.012	0.005	2.370	0.018
<i>BV</i>	0.543	0.088	6.160	0.000
<i>NI</i>	0.692	0.413	1.670	0.060
<i>SIZE</i>	0.005	0.002	1.950	0.038
<i>DIV_ASSET</i>	0.052	0.020	2.640	0.011
<i>DIV_REV</i>	-0.007	0.012	-0.530	0.302
<i>ZSCORE</i>	-0.007	0.003	-2.680	0.010
<i>IMR</i>	0.006	0.002	2.800	0.008
<i>_cons</i>	-0.049	0.040	-1.220	0.123
Number of obs	141			
F(8, 12)	30.28			
Prob > F	0.000			
R-squared	0.600			
Root MSE	0.026			

Note: See Appendix for variable definitions. [#]*P*-values are presented in one-tailed.

Collectively, the results in Table 6 indicate that reporting non-zero ICWs is positively valued by the market. The evidence is consistent with the hypothesis that ICW disclosures convey information other than the deficiencies themselves in the related assets or liabilities, and such additional information is likely to be related to the degree of effort undertaken by banks in assessing their internal control effectiveness. Concurrently, it could also be interpreted that investors do not view banks favorably if they contend that they have no ICWs.^{13,14}

13 By using the bank reporting ICWs, some may wish to regress *MV* on ICW numbers and other variables to examine the effects of ICW numbers on bank's market value. However, only 28 banks report non-zero ICWs, which makes us unable to perform such a test.

14 We thank the anonymous reviewer for giving us the suggestion that testing whether the market value of banks becomes more positive after firms remediate their ICWs. We carefully review the original data, and we find that in our cases, 18 banks reported "already remedied" within 28 observations, and 10 provided a specific date to remedy. Without the specific date of remediation, we cannot provide such additional tests. Though, we agree that such a test would be insightful, and hence future research may conduct such investigation when the data allows empirical testing.

4.4 Additional Analysis

4.4.1 Inclusion of Internal Audit Quality Variables

Because this study posits that the ICW disclosures may reveal the level of effort of banks in assessing and reporting their ICWs, other proxies that might capture the degree of such efforts may also be considered. Prior studies argue that the internal audit unit assists management in maintaining strong internal controls and would improve the quality of external auditors' work (Schneider, 1985; Pizzini, Lin, and Ziegenfuss, 2015). In this section, the qualities of internal audit in the main regression are included. Lee, Hsu, and Tang (2008) use two measures as proxies for internal audit quality. The first is whether the internal audit unit directly reports to the board of directors and, if so, the unit is considered capable of independently performing internal control tasks. The second is the number of staff working in the internal audit unit; if the number is relatively low, the quality of the internal audit may be lower because of the high workload. Moreover, if the internal audit unit meets with the independent directors (or supervisors) more frequently, this may indicate that the firm takes its internal control activities more seriously. In summary, three measures are used as proxies for the quality of internal auditing, and included in the main regression to ascertain whether the effect of the ICW disclosures is affected. Specifically, $IAUBOD = 1$ if the internal audit unit of bank i directly reports to the board of directors in year t . $\ln(LAUNB)$ is the log of the number of employees working in the internal audit unit of bank i in year t . $IAUMEET$ is the number of meetings in which the internal audit unit has discussions with the independent directors (or supervisors) of bank i in year t . Panel A of Table 7 describes the coefficients of new variables when we perform model (1). Panel B presents the results with internal audit quality included in the analysis. With the quality of internal auditing considered, the coefficient of ICW remains significantly positive ($p < 0.05$). The result is consistent with the main test.

Table 7 Additional Analysis 1
Inclusion of Internal Audit Quality Variables

Panel A: The result of model (1)				
	Coef.	Std. Err.	z	$p > z$
<i>IAUBOD</i>	-0.299	1.65	-0.18	0.857
<i>ln(IAUNB)</i>	0.454	0.611	0.74	0.458
<i>IAUMEET</i>	1.444	1.006	1.44	0.151
Panel B: The result of model (2)				
	Coef.	Std. Err.	<i>t</i>	$p > t^{\#}$
<i>ICW</i>	0.013	0.005	2.630	0.011
<i>BV</i>	0.546	0.089	6.110	0.000
<i>NI</i>	0.686	0.412	1.660	0.061
<i>SIZE</i>	0.005	0.002	1.920	0.040
<i>DIV_ASSET</i>	0.051	0.020	2.600	0.012
<i>DIV_REV</i>	-0.006	0.012	-0.470	0.324
<i>ZSCORE</i>	-0.007	0.003	-2.700	0.010
<i>IMR</i>	0.006	0.001	3.920	0.001
<i>_cons</i>	-0.048	0.040	-1.210	0.125
Number of obs	141			
F (8, 12)	33.14			
Prob > F	0.000			
R-squared	0.604			
Root MSE	0.025			

Note: See Appendix for variable definitions. [#]*P*-values are presented in one-tailed.

4.4.2 Effect of Merger & Acquisition

Based on prior studies that use Taiwanese banks as the sample firms, some studies do not deal with the merger and acquisition (M&A) issue in the sample firms, such as Liu (2008). This is somewhat reasonable because in the context of the current study, if a bank is merged with others, its market value will no longer be available, and it would not be included in our sample. If it acquires other banks, the potential effect of M&A may emerge. In that case, another new variable will be added, coded as 1 if the bank has engaged in M&A in the past two years to our original model, and the analysis will be repeated. Huang, Lin, and Chih (2017) suggest another way, which is to remove the observation that has engaged in M&A in the past two years. Both robustness checks yield similar results with the main test of this study.

Table 8 Additional Analysis 2
Effects of Merger & Acquisition

	Control M&A at stage I				Exclusion of M&A samples			
	Coef.	Std. Err.	<i>t</i>	<i>p</i> > <i>t</i> [#]	Coef.	Std. Err.	<i>t</i>	<i>p</i> > <i>t</i> [#]
<i>ICW</i>	0.012	0.005	2.370	0.018	0.013	0.005	2.450	0.015
<i>BV</i>	0.543	0.088	6.140	0.000	0.547	0.089	6.130	0.000
<i>NI</i>	0.690	0.414	1.670	0.061	0.709	0.419	1.690	0.058
<i>SIZE</i>	0.005	0.002	1.940	0.038	0.005	0.002	2.060	0.031
<i>DIV_ASSET</i>	0.052	0.020	2.630	0.011	0.052	0.020	2.630	0.011
<i>DIV_REV</i>	-0.007	0.013	-0.520	0.306	-0.009	0.013	-0.730	0.241
<i>ZSCORE</i>	-0.007	0.003	-2.680	0.010	-0.007	0.003	-2.590	0.012
<i>IMR</i>	0.005	0.002	2.810	0.008	0.006	0.002	2.740	0.009
<i>_cons</i>	-0.049	0.040	-1.220	0.124	-0.052	0.040	-1.300	0.110
Number of obs	141				135			
F (8, 12)	30.13				31.28			
Prob > F	0.000				0.000			
R-squared	0.599				0.601			
Root MSE	0.026				0.026			

Note: See Appendix for variable definitions. [#]*P*-values are presented in one-tailed.

4.4.3 Short-Term Market Reactions

As a robustness test, this study conducts the approach suggested by Hammersley, Myers, and Shakespeare (2008) to capture investors' perception of ICW disclosures. Specifically, we calculate the three-day cumulative abnormal returns (CARs) around the financial statement disclosure. Then, we regress three-day CARs on change in earnings and ICW. The untabulated result indicates that the coefficient of ICW is not significant in this specification ($p = 0.2$), and this study suggests that it may be due to the following reasons: (i) banks do not change frequently regarding reporting zero or non-zero ICW, and hence the change in ICW is less suitable in the change-design such as the CAR analysis, or (ii) the sample size is relatively small, hence limiting the identification of a significant association.

4.4.4 Classification of ICWs

Theoretically, not all ICW disclosures imply the same severity of weakness. However, regulators in Taiwan do not require banks to perform such classifications; therefore, in practice, banks do not classify their ICW disclosures. This study classifies the ICWs by their types and materiality and re-perform the analysis. However, we delete some ICW content due to data availability. By identifying the ICW content which can be collected, seven, among 28, ICWs are classified as the severe ICWs (*SEVICW*). Based on the 28 observations that show non-zero ICWs, this study explains that the market value of equity using *SEVICW*, book values, earnings, other control variables, and inverse Mills ratio obtained in the first stage of Heckman procedure. The coefficient of *SEVICW* is found to be insignificant ($p = 0.852$), indicating that disclosing less and more severe ICWs are not valued differently by investors. Such result is consistent with the argument that disclosing non-zero ICWs reveals that the firm is diligent in identifying ICWs, and *ex ante* it is not expected that disclosing less and more severe ICWs is related to different levels of diligence. Though, due to the small size, i.e., 28 observations, this study suggests that caution is necessary when interpreting such result. It would be more appropriate to re-examine whether the severity of disclosed ICWs is related to varying valuation in the future when the sample size that discloses non-zero ICWs substantially increases.

4.4.5 Other Methods to Mitigate the Endogeneity Problem

This study follows some relatively recent studies (e.g., Lennox et al., 2012) and applies propensity score matching to address the endogeneity problem of reporting ICWs. First, the propensity score on the basis of Model (1) is estimated, and then a bank reporting non-zero ICWs is matched with a bank reporting zero ICWs without replacement. After 1:1 matching, the differences of variable means between the treated group and control group become insignificant, reflecting the quality of matching. A significant difference of 0.078 is found in the means for *ICW* ($p = 0.018$). Thus, once the bank characteristics are balanced between two groups, the treatment effect of ICW correlates positively with the bank value. In other words, the main findings are unaffected by adopting the propensity score matching method.

In order to alleviate the common endogeneity problems, the approach constructed by Larcker et al. (2007), and adopted by Laksmana (2008) and Johnstone, Li, and Rupley (2011) is also applied. The procedures are summarized as follows. First, the ICW on several determinants (model (1)) is regressed, and the residuals are obtained. The residuals from the regression indicate whether a firm's ICW is above or below a benchmark value.

Then, two new variables are created on the basis of the sign of the residuals. ICW_PR = residual if the residual from model (1) is positive; 0 otherwise. ICW_NR = residual if the residual from model (1) is negative; 0 otherwise. Finally, the market value of equity is explained by the two new variables, ICW_PR and ICW_NR , book value of equity, net income, and other control variables. The untabulated result still indicates a positive coefficient for ICW_PR (coefficient 0.005 with $p = 0.005$) while the coefficient of ICW_NR is negative (coefficient -0.022 with $p = 0.113$), indicating that banks reporting ICWs than the benchmark (ICW_PR) have higher market values.

5. Conclusion

An organization's internal control system is designed to provide reasonable assurance regarding the achievement of operational effectiveness and efficiency, reliability in financial reporting, and compliance with applicable laws and regulations. To ensure that an internal control system is well-functioning, firms in many developed countries are required by their regulators to assess their internal control effectiveness and to disclose any deficiencies or weaknesses discovered in the assessment.

The present study focuses on the value effect of disclosing ICWs by using data on listed banks in Taiwan for the 2001–2014 period. This investigation is critical because if the ICW disclosures are not valued by the market, then management incentive to report ICWs would be low and firm compliance with the regulator requirements regarding ICW disclosures might not be thorough. Empirically, the potential endogeneity problem related to reporting ICWs is first addressed by using Heckman's two-stage method. Subsequently, the Ohlson model is applied to examine the value effect of reporting non-zero ICWs. The empirical results indicate that reporting non-zero ICWs is positively valued by the market, which is consistent with the hypothesis; this reveals that the effort of firms in assessing their internal control effectiveness is appreciated by the market. Collectively, the findings contribute to the field by showing support for regulator's disclosure requirements and encouraging managers to diligently report ICWs.

This study has the following limitations. First, the observations are from the banking industry and the generalizability of the findings to other industries requires examination. Future research may consider extending the research scope to companies in other industries to examine the value effect of ICW. Second, not all ICW disclosures imply the same severity of weakness. Prior studies document different effects of account- and

company-level ICW disclosures under SOX 404 (e.g., Bedard and Graham, 2011). However, regulators in Taiwan do not require banks to perform such classifications; hence, in practice, banks do not classify their ICW disclosures, thus conducting the analysis is infeasible. Third, this study acknowledges that the short-term market reaction specification may provide some further evidence on the role of ICW reporting. However, due to the data limitation, i.e., very few observations in the sample have changed their quality of identifying and reporting ICW, conducting a short-term market reaction test that would yield reliable empirical findings is not possible. Hence, it is expected that researchers who are interested in this research question may provide more evidence in the future when the data limitation is not an issue. Fourth, this study also acknowledges that the effect of ICW disclosures on firm value might be indirect. In other words, ICW disclosures might be related to the cost of capital, earnings management, auditing quality, or governance. Thus, ICW disclosures affect firm value. Although a significantly positive association between ICW and firm value is documented, future studies should consider examining how ICW disclosure relates to the cost of capital, earnings management, auditing quality, or governance.

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Appendix Definitions of Variables

Variable	Definition
<i>ICW</i>	= 1 if bank <i>i</i> discloses a nonzero value of ICW in year <i>t</i> and 0 otherwise.
<i>SIZE</i>	= The log of total assets (in millions) of bank <i>i</i> at the end of year <i>t</i> .
<i>ln(AGE)</i>	= The log of the age of bank <i>i</i> in year <i>t</i> .
<i>AGGLOSS</i>	= 1 if bank <i>i</i> reports a loss for continuing operations in year <i>t</i> and <i>t</i> -1 and 0 otherwise.
<i>ROA</i>	= Net income of bank <i>i</i> in year <i>t</i> , scaled by total assets at the end of year <i>t</i> .
<i>sd(ROA)</i>	= Standard deviation of ROAs of bank <i>i</i> measured within year <i>t</i> -1, <i>t</i> -2, and <i>t</i> -3.
<i>DIV_ASSET</i>	= 1 minus the absolute value of “loans minus other profit-generating assets, scaled by total profit-generating assets.”
<i>DIV_REV</i>	= 1 minus the absolute value of “interest revenues minus noninterest revenues, scaled by total revenues.”
<i>FOREIGN</i>	= 1 if bank <i>i</i> reports any foreign currency adjustments higher than the median value of the adjustment in year <i>t</i> and 0 otherwise.
<i>EXGROWTH</i>	= 1 if the revenue growth of bank <i>i</i> is in the top quintile among all banks in year <i>t</i> . Revenue growth is calculated as the difference of interest revenues and communion revenues between year <i>t</i> and <i>t</i> -1 scaled by revenues in year <i>t</i> -1 and 0 otherwise.
<i>BDSIZE</i>	= The log of the number of board directors of bank <i>i</i> in year <i>t</i> .
<i>BDMGER</i>	= Percentage of managers who are also directors on the board of bank <i>i</i> in year <i>t</i> .
<i>BDHD</i>	= Percentage of shares held by the board directors of bank <i>i</i> in year <i>t</i> .
<i>MGERHD</i>	= Percentage of shares held by the managers of bank <i>i</i> in year <i>t</i> .
<i>MODEV</i>	= Ratio of the percentage of controlling seats to the percentage of controlling shares.
<i>BDPLEDGE</i>	= Percentage of shares pledged by the board directors of bank <i>i</i> in year <i>t</i> .
<i>BLOCKHD</i>	= Percentage of shares held by the blockholders of bank <i>i</i> in year <i>t</i> .
<i>LEGALHD</i>	= Percentage of shares held by legal persons in year <i>t</i> .
<i>GOVHD</i>	= 1 if the bank <i>i</i> 's shares are owned by the government and 0 otherwise.
<i>MV</i>	= Market value of bank <i>i</i> at the end of year <i>t</i> , scaled by total assets at the end of year <i>t</i> -1.
<i>BV</i>	= Book value of bank <i>i</i> at the end of year <i>t</i> , scaled by total assets at the end of year <i>t</i> -1.
<i>NI</i>	= Net income of bank <i>i</i> in year <i>t</i> , scaled by total assets at the end of year <i>t</i> -1.
<i>ZSCORE</i>	= The log value of <i>ROA</i> plus capital ratio divided by <i>sd(ROA)</i> .
<i>IMR</i>	= Inverse Mills ratio measured by Heckman two-stage model.
<i>IAUBOD</i>	= 1 if internal audit unit of bank <i>i</i> directly reports to the board of directors in year <i>t</i> .

Variable	Definition
<i>ln(IAUNB)</i>	= The log of the number of employees working in the internal audit unit of bank <i>i</i> in year <i>t</i> .
<i>IAUMEET</i>	= The number of meetings in which the internal audit unit has discussions with the independent directors (or supervisors) of bank <i>i</i> in year <i>t</i> .

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