Chapter 2 Literature Review

In this chapter, we review literatures on banks’ earnings management and the determination of exchange ratio for mergers and acquisitions using domestic and international data.

2.1. The detects of earnings management

There are many studies trying to develop a model to testify earnings manipulations by managers in firms. Healy (1985) investigates if managers manipulate earnings by accrual items or accounting methods in cooperation to bonus plans of companies. He compares mean total accruals scaled by lagged total assets across the earning management partitioning variables and predicts that systematic earnings management occurs in every period. The model he developed for measuring nondiscretionary accruals is as followed:

\[ NDA_t = \frac{\sum_{T} TA_t}{T} \] (1)

Where

\( NDA \) = estimated nondiscretionary accruals;

\( TA \) = total accruals scaled by lagged total assets;

\( t = 1, 2...T \) is a year subscript for years included in the estimation period.

Empirical results based on the model above in Healy’s paper support his null hypothesis, which indicates that managers actually manipulate earnings in order to meet their bonus plans.

DeAngelo (1986) investigates whether companies tend to report less earnings in income statements in order to get lower dealing prices when preparing to have management buyouts. He follows the model developed by
Healy and re-arranges that item into:

\[ NDA_t = TA_{t-1} \]  

(2)

A common feather of Healy and DeAngelo models is that they both use total accruals from the estimation period to proxy for expected nondiscretionary accruals. If nondiscretionary accruals are constant over time and discretionary accruals have a mean of zero in the estimation period, then both Healy and DeAngelo models will measure nondiscretionary accruals without error. If, however, nondiscretionary accruals change from period to period, then both models tend to measure nondiscretionary accruals with error.

Jones (1991) proposes a model relaxing the assumption that nondiscretionary accruals are constant. By focusing on companies protected by imports limitation, she attempts to control for the effect of changes in a firm’s economic circumstance on nondiscretionary accruals and develops the model as followed:

\[ NDA_t = \frac{\alpha_1}{A_{t-1}} + \alpha_2 \Delta REV_t + \alpha_3 PPE_t \]  

(3)

Where,

\( \Delta REV_t = \) revenues in year t less revenues in year t-1 scaled by total assets at t-1;

\( PPE_t = \) gross property plant and equipment in year t scaled by total assets at t-1;

\( A_{t-1} = \) total assets at t-1; and

\( \alpha_1, \alpha_2, \alpha_3 = \) firm-specific parameters.

Estimations of the firm-specific parameters are generated using the
following model in the estimation period:

$$TA_t = \frac{a_1}{A_{t-1}} + a_2 \Delta REV_t + a_3 PPE_t + \varepsilon_t \quad (4)$$

$a_1$, $a_2$, and $a_3$ denote the OLS estimates of those firm-specific parameters mentioned above, and TA is total accruals scaled by lagged total assets. Empirical results in her study indicate that the model is successful at explaining around one quarter of the variation in total accruals.

However, Dechow, Sloan, and Sweeney (1995) criticize Jones model’s weakness by considering changes in revenues and fixed assets in estimating nondiscretionary accruals, which could not eliminate purposed manipulations made by credit sales. As a result, they extend the Jones model into:

$$NDA_t = \alpha_1 \frac{1}{A_{t-1}} + \alpha_2 (\Delta REV_t - \Delta REC_t) + \alpha_3 PPE_t \quad (5)$$

Where

$$\Delta REC_t = \text{net receivables in year } t \text{ less net receivables in year } t-1 \text{ scaled by total assets at } t-1.$$ 

The estimates of $\alpha_1$, $\alpha_2$, $\alpha_3$ and nondiscretionary accruals during the estimation period are those obtained from the original Jones model. The only adjustment relative to the original one is that the change in revenues is adjusted for the change in receivables in the event period, and the rationale of this kind of adjustment is that it’s easier to manage earnings by exercising discretion over the recognition of revenue on credit sales than on cash sales.

They also compare alternative accrual-based model used widely for detecting earnings management, including the Healy model, the DeAngelo model, the Jones model, and the modified Jones model. They try to find out
the most accurate one in estimating earnings management by comparing the specification and power of test statistics across the measures of discretionary accruals generated by the models. Empirical results indicate that all of the models appear well specified when applied to a random sample of firm-years; however, the models all generate tests of low power for earnings management of economically plausible magnitudes. Finally, they conclude that the modified Jones model exhibits the most power in detecting earnings management.

In 1999, Erickson and Wang (1999) investigate whether acquiring firms attempt to increase their stock price prior to a stock for stock merger in order to reduce the cost of buying the target. By using a similar method to the Jones model, they find that acquiring firms in a sample of stock for stock mergers completed between 1985 and 1990 indeed manage earnings upward in the period prior to the merger agreement. Empirical results of their study also indicate that the degree of income boosting earnings management is positively related to the relative size of the merger.

Many studies in Taiwan focus on the reasons of managers’ incentives to manipulate earnings. Some researches find that managers in banks tend to “window-dress” their reported earnings because of the “threshold effects” (Lin, 2002, and Shih, 2002), and others find that managers do so in order to maintain the capital adequacy ratio or other restrictions required by authorities (Lin, 2001).

Besides managers’ motivations toward earnings management, researches are also conducted to investigate if there are seasonal differences in manipulation in Taiwan’s banking industry. Liu (1999) testifies discretionary accruals of each quarter generated by the Jones model by T-statistics and F-statistics to see whether significant difference exist between four quarters.
Empirical results prove that discretionary accruals in the fourth quarters tend to be larger than those in the other three quarters. This paper finds that banks tend to smooth both quarterly incomes and annual reported earnings. Liu also compares the percentage of discretionary items in each quarter to total amount yearly and tries to find out which discretionary item banks use most for earnings management. Empirical results indicate that banks usually manipulate earnings by interest receivable, total loans, allowance for bad debts, reserves, and loans in arrear. Moreover, he finds that the percentage of these discretionary items in the fourth quarter is much larger than those in other three quarters compared to the total amount of a year.

2.2. Exchange ratio used in M&As activities

In the case of bank mergers, determination of the exchange ratio is an important issue, which may influence the success or failure of mergers.

Larson and Godenes first develop an exchange ratio (referred as ER in the following) determination model, which is based on the expected post-merger price-earnings multiples (referred as P/E in the following) in 1969. It is assumed that wealth positions of both the acquiring and acquired company shareholders have to be maintained after the combination. And it figures out the relationship between P/E and ER by using stock price, earnings, outstanding shares, and expected post-merger P/E data of those companies. Although this model could not determine a ratio for a certain merger in practice, it may indicate an acceptable range for both the acquiring and acquired companies to negotiate with.

However, Yagil (1987) finds that growth potential is an important factor when determining ER, Larson and Godenes model provides a poor estimate of
the yield on a common stock without explicitly incorporating growth opportunities. As a result, Yagil develop another ER determination model based on the post-merger dividend growth reflecting both acquiring and acquired companies’ growth expectations.

Three studies have empirically tested Larson and Godenes model. Conn and Nielsen (1977) examine major mergers in the US during 1960~1969. They divide the whole merger period into the month of announcement, consummation, and following consummation, and find little consistency by empirical results of these three different time periods generated from the model. They also use two statistical tests, which are the non-parametric Chi-square and the paired difference test, providing evidence supportive of Larson-Godenes model. The assumption limitation of the model may be the reason that leads to the mixed results. Therefore, Conn and Lahey (1991) improve Larson-Godenes model by making adjustments for market wide changes in prices and including risk-return changes. The results show that the empirical support for Larson-Godenes model increases with the expanded model.

Cooke, Gregory, and Pearson (1994) extend the model to consider UK mergers on a sample of 95 UK takeovers between 1984~1988 and find greater support for Larson-Godenes model in the UK than in the US. Bae and Sakthivel (2000) compare the empirical validity of Larson-Godenes model with that of Yagil model in predicting ERs with 421 mergers during the period of 1981 to 1994. Based on these two models, they estimate appropriate ranges of ERs derived from each model and then compare to actual ERs for each merger. They conclude that the prediction ability of Larson-Godenes model is better than that of Yagil model since the difference between estimated ERs
and actual ERs of the former one is much smaller than the latter.

There are few researches discussing about exchange ratios in Taiwan until 2000. Mou (2000) simulates the mergers of Hunan, First, and Chang hwa commercial banks and determines exchange ratios for each combination by Larson-Godenes model. She also predicts combined earnings by dividend behaviour model developed by Marsh and Merton and applies those presumptive earnings to Larson-Godenes model. Empirical results of this study show that although there are factors unable to be quantified in numbers when deciding exchange ratios in M&As transactions, outcomes of Larson-Godenes model could provide reasonable bargaining areas for involved parties.

Afterwards, some studies focusing on mergers and acquisitions in Taiwan's banking industry are presented because of the legislation of Financial Holding Company in 2001. However, most of studies discuss about only one or part of combinations in FHC. Huang (2001) calculate exchange ratios for Mega, Sinopac, Cathay, and Fubon financial holding companies by evaluation model and Larson-Godenes model as well. Empirical results in his paper indicated that there are deviations between actual dealing prices and proposed exchange ratios by models and causes of these deviations may be different natures of involved parties or premiums for obtaining control rights.

Lee (2002) investigates the exchange ratios used in founding Fubon financial holding company and evaluates the performance and risk after completion of mergers. She also finds out that actual exchange ratios are different from those calculated from Larson-Godenes model. Empirical results show that performance of four months after mergers of Fubon are worse than before, but systematic risks are much lowe.
Li (2002) uses “discounted cash flows” (DCF) method to quantify synergies both acquiring and acquired companies with M&As. From empirical results based on the data of Sinopac FHC, he finds that the actual exchange ratio and the hypothesized one calculated by DCF method are very close to each other. Therefore, he suggests companies, which are going to combine with others, had better to quantify expected synergies first in order to get more accurate dealing prices for both acquiring and acquired companies.

Kuo, Chen, and Tsen (2003) use Larson-Godenes model and extend it by taking account of market risk to simulate 7 takeovers for presumptive mergers in Taiwan's banking industry. And they also use Marsh-Merton dividend behavior reduced form to estimate the expected post-merger price-to-earnings ratio. Their empirical results indicate bargaining area implies some information to help mergers candidates to negotiate with.