# Accounting earnings response coefficient: An extension to banking shares in Asia Pacific countries

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ABSTRACT

This paper reports new finding on earnings response coefficients for banking firms on how disclosures on total earnings and disaggregated fee earnings are used by investors to change share prices prior to earnings disclosures. The information relating to total earnings influences share prices significantly in all four banking sectors studied, all of which have sufficiently liberalized capital markets. Australian investors appear to use information on disaggregated non-interest fee income to revise share prices significantly: not so in other markets. The investors in Malaysia and South Korea appear to consider changes in fee income as bad news with negative price impact, anomalous to theory. The Australian investors appear to regard both total and fee incomes as equally important whereas investors in other markets either ignore or consider changes in fee income as bad news for share valuation. This study extends the literature on this topic from non-bank to banking firms.

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## 1. Introduction

The change in *total* earnings reported in financial statements of firms has been shown to be a major determinant of share prices. Fairfiled, Sweeney, and Yohn (1996) showed this for the US firms while DeYoung and Rice (2004) studied the US commercial banks, the only study of banks: see also Stiroh (2002). The behavior of non-bank shares has been studied for quite some time, and there is an excellent review of this literature in Lev (1989) and again in Kothari (2001). They concluded that the earnings variables explain a small variation in the price movements of the shares, with the R-square typically lower than 10%. To the best of our knowledge, no studies exist on how changes in bank's *disaggregated* earning reports such as non-interest income disclosures are correlated with bank share prices nor has there been a study of responses of banking shares in this regard.[2]

This study is thus a modest attempt to explore if there is a significant relationship between changes in total earnings and cumulative abnormal returns of bank stocks, as usual, measured by the established CAR methodology in accounting literature. Because the banking industry is more regulated than non-bank industry, the behavior of investors in revaluing share prices based news of earnings

in this industry is important: further, banking firms have shot up for attention in current research. The revenue of most banks (not the super banks with investment/securities businesses) consists of interest income and non-interest income, as disaggregated items, whereas the non-banks revenues are more complex. Hence, the share price responses to earnings news are measured as the earnings response coefficients (ERC). ERC can be estimated using regression methodology with earnings variables such as total earnings disclosures, interest income and non-interest fee income disclosures.

Current literature appears to take a different focus. The latest studies in ERC attempt to explain how do auditor selections, equity fund raising, stock splits and other accounting variables affect the *non-bank* stock price movements (Lin, Liu & Wang, 2009; Robinson, 2008; Park & Pincus, 2001; Lee et al., 2005; Chen & Zhang, 2007). Their findings appear to reach a consensus that ERC of firm changes with firm specific variables. With the addition of such variables, ERC regression tests produce higher R-square values to about 20%.

This study focuses on the effect of earning announcements on stock prices of commercial banks in four accounting environments in Australia, South Korea, Malaysia, and Thailand.[3] We measure this effect for these Asia Pacific countries, all of which had substantial banking reforms that permit banks to charge fees, and be less controlled by supervision of prudential authorities during the test

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  [2] There is a published study by Rose (1989), which tested non-financial (not specifically banking) firms with data over pre-1985 period. This spearheaded other studies of non-bank firms to-date. For disaggregated test, see Ohlson and Pennman (1992).

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[3] Interested readers are referred to the following sources for a description of the respective banking sectors of three countries in Chen and Zhang (2007), Chansarn (2005), Choi and Iftekhar (2005), Bank of Korea (2002) and the central bank websites of the four countries. These countries together are often described as having developed accounting institutions sufficiently well and that the share markets are Fama-efficient.

period prior to the Global Financial Crisis, which started in December, 2007. These countries have made substantial progress in reforming and strengthening accounting practices, and these reforms are likely to be a source for encouraging more and better information usage by investors in these market places. Following the 1997/8 Asian financial crisis, the banks have been given greater freedom to decide on how they would charge fees for their services, and thus the magnitude of non-interest income is growing although it has, as of 2010, not surpassed interest incomes in the four countries.

This study, by revealing evidence on stock market reactions to accounting information of commercial banks, is expected to help establish the usefulness of disclosure of both total earnings and a disaggregated item (fee income) reporting in these countries. Regulators may also be interested in this since regulations require reporting of sub-items in disclosures. Fee income is increasing as a proportion of total income just as in the US, where fee income is not yet a subject of study as is also the case of bank shares in other than the US market. Does non-interest income attract the attention of investors in these countries?

## 2. Earnings response coefficient

Ball and Brown's (1968) study provided the major impetus for empirical examination of stock market price formation to release of accounting information. This led to studies of impact of accounting information disclosures on share prices of non-bank firms. They showed convincingly that there is valuable information content in accounting earnings disclosures, which appear to elicit a stock price adjustment just prior to the disclosure of information (consistent with the efficient market theory) as response to changes in the reported earnings of firms. Kothari (2001) showed strong evidence of how the total change in share prices can be traced to the amount of a firm's value change as earnings changes. Collins and Kothari (1989) developed a theory of how accounting earnings is related to share price changes.

The latest study using the ERC approach in the non-US stock markets are Lee, Han, Wu, and Chow (2005) for China, Inman, Douthett, and Kooyul (2003) for Korea. The study by Lee et al. explores the determinants of listed Chinese company governance practices and how the practices affect domestic investor reaction to earnings reports. They find that investors base their valuation decisions, at least in part, on these earnings reports. This is indicated by the significant relationship between disclosed unexpected earnings and cumulative abnormal returns. The other study examined how the wave of liberalization of stock market affected stock price behavior, and changed the role of accounting information for investment decisions. Their results indicate that the co-movement behavior of stock prices decreased and stock price differentiation based on individual firm characteristics increased after market liberalization. The results also show that the explanatory power of accounting numbers measured by earnings changes increased after market liberalization.

Capital market theories – both efficient market theorem and the widely-accepted market model – suggest that market prices of assets respond to value-relevant accounting/economic/financial information disclosed to the market by firms, both non-bank and banking firms. The response of the latter has yet been studied vigorously. Interest income and non-interest income disclosures (an item of disaggregated income reporting commonly available since the 1990s in financial statements of a firm) are thus two items of key information that, when disclosed, should influence the value of the bank as per theory.

Efficient market hypothesis suggests that the market will react ahead of disclosure time and the resulting prices shall reflect the value of the information to investors trading the bank's shares. The market model (Sharpe, 1963) suggests that the extent of such information effect may be measured as the cumulative abnormal returns, CAR, around the time of announcement as is commonly done in accounting

research, an entrenched methodology. This measure (as well as similar such measures: see Brown & Warner, 1985 and Lyon, Barber, & Tsai, 1999) enables the impact of the disclosed information to be measured as the CAR, very popular in accounting and finance research papers.

As shown by Ball and Brown (1968), the earnings response coefficient can be measured by relating the unexpected earnings to the measure of CAR. A significant relationship between the CAR as the dependent variable and the unexpected changes in the value of interest income and non-interest income would mean that there is a significant impact on the share prices of the disclosed sub-item as accounting information. One would be able to improve the accuracy of parameter estimates by using some econometric refinements as we aim to do in this paper by doing a panel regression, which corrects parameter for time series and country variations. There is a large volume of studies on earnings response coefficient tests on total income: please see Kothari *op cit.*, a review paper that outlines the main findings on total earnings disclosures of non-bank firms. This paper is about extending this finding to a group of countries on total earnings disclosures of *banking firms* (which have yet been studied in these countries) as well as measuring the coefficient for non-interest income disclosures.

## 3. Literature on earnings response coefficient

In this section we provide a review of empirical literature on this subject relating to mostly banking studies. We start with Kothari (2001) providing a review of the literature on this topic. While Ball and Brown's (1968) work can be considered as a precursor of studies on earnings response coefficient, ERC, there has been a continuing stream of literature following that lead. Before the 1960s, the emphasis was on fundamental analysis, where evaluation of securities were done based on past and present information (mainly from financial statements) and industry and other macroeconomic data. According to Gaffikin (2007), the main aim of these analyses then was to uncover mispriced securities and thus use the information to trade on these securities to take advantage of mispricing.

Interest in the ERC as a topic of research is most clearly traced to the market price reaction studies. For instance, Collins and Kothari (1989) derive a relationship between abnormal returns and unexpected earnings based upon capitalization of earning model. This has the advantage of enabling the empirical behavior of the ERC to be related to a richer theoretical context than a simple market reaction approach would allow (Willett, Kim, & Jang, 2002). ERC has been predominantly defined as the coefficients measure of unexpected *total* accounting earning obtained by regressing abnormal share market return (returns usually adjusted by market model) on earnings. Some studies included other variable(s) placed as control variables (Chansarn, 2005; Collins & Kothari, 1989; and Willett et al., 2002). It is normally derived by regressing unexpected (abnormal) share returns, the CAR, and the unexpected *total* earnings of usually non-financial firms to test for a relationship. There are many published studies on the topic, and we refer to existing review articles cited above.

One critical commentator states that the low explanatory power of such regressions in this line of research can be interpreted as accounting earnings being uninformative about value changes: Lev, 1989. This lack of informativeness could be due to accounting earnings not being designed to measure value changes alone: Watts and Zimmerman (1989). To the extent that earnings management is subtly orchestrated by management (income smoothing evidence) the ability of reported accounting earnings to closely reflect the value changes of accounting earnings is perhaps further jeopardized. Despite these criticisms, ERC studies have been useful in measuring the usefulness of accounting earnings disclosures as well as grounding disclosures as useful.