Value Relevance of Simple Economic Value Added (EVA) in Mergers and Acquisitions

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บทคัดย่อ

บทความวิจัยนี้จัดทำขึ้นเพื่อศึกษาความเกี่ยวเนื่อง กับมูลค่าของตัววัดมูลค่าเพิ่มทางเศรษฐศาสตร์ในแง่มุม ที่ว่าตัววัดมูลค่าเพิ่มทางเศรษฐศาสตร์มีความเกี่ยวเนื่อง มากกว่าตัววัดทางบัญชีอื่นหรือไม่ในเหตุการณ์การควบรวม กิจการ การทดสอบข้อมูลแบบสัมพัทธ์ (Relative information content test) ถูกกำหนดขึ้นเพื่อทดสอบ ความสัมพันธ์ของตัววัดมูลค่าเพิ่มทางเศรษฐศาสตร์กับ ผลตอบแทนส่วนเกินราคาควบรวม ผลตอบแทนส่วนที่ เกินปกติของผู้ควบรวมกิจการ และผลตอบแทนรวม ระหว่างผลตอบแทนส่วนที่เกินปกติของผู้ควบรวมกิจการ และผู้ถูกควบรวมกิจการ ว่ามีความสัมพันธ์มากกว่า ตัววัดทางบัญชีอื่นหรือไม่ ผลของการทดสอบข้อมูล แบบสัมพัทธ์พบว่ากระแสเงินสดจากการดำเนินงานมี

ความสัมพันธ์กับผลตอบแทนส่วนเกินราคาควบรวมและ ผลตอบแทนรวมระหว่างส่วนที่เกินปกติของผู้ควบรวม กิจการและผู้ถูกควบรวมกิจการมากที่สุด แต่พบว่าตัว วัดมูลค่าเพิ่มทางเศรษฐศาสตร์มีความสัมพันธ์ กับ ผลตอบแทนส่วนที่เกินปกติของผู้ควบรวมกิจการ มากที่สุด อย่างไรก็ตามความแตกต่างของระดับความ สัมพันธ์ในการอธิบายผลตอบแทนต่างๆ ของตัววัด มูลค่าเพิ่มทางเศรษฐศาสตร์และตัววัดทางบัญชีอื่นไม่มี นัยสำคัญ จึงสามารถสรุปได้ว่าไม่มีหลักฐานสนับสนุน ที่เพียงพอที่จะกล่าวอ้างถึงความสามารถของตัววัดมูลค่า เพิ่มทางเศรษฐศาสตร์ที่มีมากกว่าตัววัดทางบัญชีอื่นในกรณี การควบรวมกิจการ

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Abstract

This study investigates the value-relevance of the EVA (Economic Value Added) compared with other accounting measures in mergers and acquisitions. Relative information content test is conducted to investigate whether EVA is more highly correlated with the takeover premium, acquirers' abnormal returns and combined returns, than other traditional accounting measures (Cash Flow from Operation (CFO), Earning before Extraordinary Items (EBEI), Residual Income (RI)). Relative information content test shows that CFO is more highly correlated with the takeover premium and combined returns, while EVA can best describe the variation in acquirers' abnormal returns. However, these differences in explanatory power are not significant. These results do not support the claim that EVA outperforms other accounting measures in mergers and acquisitions.
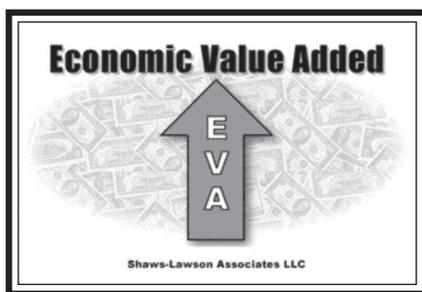
1. Introduction

There are many ways to measure the performance of firms in generating profit and subsequently creating the value for shareholders such as discounted cash flow, net present value, Return on Equity (ROE), Return on Assets (ROA), earnings per share and etc. For many years, the idea to measure whether the company is really earning genuine profits is first developed by Alfred Marshall[1]. He proposes that the company could create the wealth for shareholders only if its revenues are sufficient to cover the operating costs and cost of capital. That can be referred to economic income or economic profit (EP) and consequently the earliest mention of residual income (RI). Moreover, it can be implied that the company that shows profitability in terms of accounting measure may be distorted the value creation to shareholders because it fails to cover the cost of capital.

Based upon the abovementioned economic profit, Stern Stewart & Company introduces the concept of Economic value added (EVA(r)) as their trademark performance measurement. EVA[2] has the similar concept of residual income[3] but differs in the way that EVA adds some adjustments to operating profits and capital. EVA is simply the

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[1]   See Mäkeläinen (1998) and Kyriazis and Anastassis (2007)

[2]   EVA can be defined as the net operating profits after tax (NOPAT) + Adjustment from Stern stewart - k*(Capital + Adjustment from Stern stewart)

[3]   Residual income can be defined as NOPAT- k*(Capital) as claimed by Biddle et al. (1997). Note that there are many ways (formulas) in calculating residual income.

net dollar return to capital providers. A positive EVA indicates the value created to capital providers; a negative EVA shows the destruction to capital providers' value. According to Stern et al. (1996), EVA is defined as an integrated financial management system for evaluating and rewarding the periodic performance of the managerial level that encourages the decentralized decision-making. Moreover, EVA model focuses on capital efficiency and ownership incentives in such a way that the company ties the management compensation according to the EVA improvement in each year. As a result, it encourages the manager to behave like the owner of the company and act in the ways that increase the value of firm. This would implicitly help in solving the agency problem by tying managers bonuses to a performance measure that is highly correlated with shareholder value, thus aligning managers interest with shareholders, in other words, with aligned interest, the common interest is to maximize shareholder's wealth.

Several companies have adopted EVA in the early 1990s. For example, Coca Cola co. has adopted it in early 1980s, AT&T corp. in 1994, IBM in 1999, and Herman Miller Inc. in late 1990s. According to Kyriazis and Anastassis (2007), several EVA-adopted US companies have experienced a significant increase in shareholders' wealth. According to the Stern Stewart's study[4], it is found that companies that implemented EVA in the 1990s outperformed their peers by an average of 8.3% per annum over the five years following the adoption and created total abnormal shareholder wealth of $116 billion. Some papers find that EVA technique has subsequently obtained high abnormal returns. For example, O'Byrne (1997) observes positive and significant correlation between EVA and shareholder returns.

After reviewing many papers related to EVA, most papers cast doubt on the superiority of EVA compared with the traditional accounting measures and examine them by their explanatory power in the stock performance (abnormal stock returns as a proxy). Because the previous empirical research tests the value-relevance of EVA in explaining cross-sectional abnormal stock returns (mostly in US market), the main motivation in this study is to examine the relative information content or value-relevance of EVA in explaining the premium received in mergers and acquisitions in UK market. We attempt to investigate whether a firm's EVA has higher correlation with the premium received in takeover event than the traditional accounting measures. In other words, we examine whether EVA can beat other accounting measures in explaining the variation in the premium received in takeover event. The motivation that we test EVA using mergers and acquisitions data is that the managers

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[4] See Stewart et al. (2002) in EVAluation

should possess more sophisticated information[5] than investors do in mergers and acquisitions. The managers usually know more about news or events in any decision-making in the main corporate transactions of the company than outsiders do. This shows interesting evidence in finding out the value-relevance or efficiency of EVA model in measuring these merging firms that the managers (informed investors) get involved in. Therefore, the takeover premium[6] can be observed to reflect the additional value-relevance of EVA in mergers and acquisitions. If EVA has value-relevance in mergers and acquisitions, the results should show the positive relationship between EVA and the premium received.

By examining takeover premium as the main dependent variable, this paper also analyzes the acquirers' abnormal returns and combined returns[7] of target and bidding firms. Our three hypotheses are conducted to observing the relationship between EVA and the premium received in takeover event separated into the view of target, bidding and combined firm. First, we investigate the relationship between the EVA of target firm and target premium. If EVA has the value-relevance, the EVA of target firm and target premium should show some relationship. We expect the EVA of target firm and target premium to have a positive relationship, it means that the target firms that have high EVA receive high target premium because they are the good quality firms so many potential bidders want to acquire it which eventually boost up the takeover premium. As a result, it shows that EVA has value-relevance in kind of information content on target side in mergers and acquisitions. Second, we examine whether EVA of bidding firm has significant positively correlation with acquirers' abnormal returns[8]. This means that the bidding firm with high EVA will make better decisions in acquisitions, resulting in obtaining high abnormal returns. Lastly, combined returns are analyzed as dependent variable. We expect the positive relationship between combined EVA[9] (target + bidding firms) and combined returns. The high EVA of both target and bidding firms should end

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[5]   The managers can easily assess and sophisticatedly verify all information about the company than outsiders do in takeover deal that is the main corporate decision-making of the company. This is an advantage in helping us screening the firms tested in this paper which eventually resulting in the more reliable test of EVA performance. We do not focus on the information asymmetry between managers and outsiders that is beyond the scope of this research.

[6]   Takeover premium has the same meaning as target premium. We will use it interchangeably.

[7]   Combined returns are the weighting between the targets' abnormal returns and acquirers' abnormal returns by using the market value of each merging firm three months before the takeover announcement.

[8]   Acquirers' abnormal returns are measured during the period of event study between 20 days prior to and after the announcement date.

[9]   In combined returns, we weight each dependent and independent variables from target and bidding firms by using their market value five days prior to the announcement date. Evidence from Heron et al. (2002)

up with the wealth of the shareholders of the firms engaged in mergers activity that eventually will be reflected in combined returns. In conclusion, the main investigation is to test the relationship between the premium received and EVA compared with other traditional accounting measures in order to make an inference about the value-relevance of EVA in mergers and acquisitions.

2. Previous Research

EVA receives widespread attention among practitioners and academics alike. Many researchers conduct studies to compare the performance of EVA with other valuation approaches. There are more papers disagreeing about the superiority of EVA than those support it. Chen and Dodd (2001) study on the value-relevance (information content) of three profitability measures: operating income, residual income, and EVA by using Stern Stewart 1,000 database of U.S. companies. They find no evidence to support that EVA is the best measure for valuation purpose. Fernandez (2002) examines 28 largest Spanish companies to analyze the relationship between shareholder value creation and various parameters (Economic Profit, EVA) and his result find that only 4 and 2 for Economic Profit and EVA have the highest correlation with shareholder value creation in only 4 and 2 companies respectively from 28 companies. Tortella and Brusco (2003) do not observe the significant market reaction to the adoption of EVA technique. Mir and Seboui (2006) collect 247 firms for the period 1998-2004 from the list of EVA firms in Fortune site and examine the relationship between EVA and the

market value (approximated by created shareholder value) and find non-significant relationship. Tsuji (2006) tests the effectiveness of EVA in measuring the corporate market value compared with other valuations (cash flow, operating income, and profit after tax) on 561 listed companies in Tokyo Stock Exchange in Japan. The results reveal that corporate market value in both levels and changes have strong relationship with other valuations than EVA. Griffith (2004) examines the questions raised about whether analysts should use EVA to forecast stock performance. He uses data from Stern Stewart and finds that investors in firms that use EVA to forecast stock performance would have suffered significant losses. Griffith (2006) examines EVA in association with stock performance on Stern Stewart& Co.2004 U.S.1000 EVA/MVA Annual Ranking Database. His conclusion is that EVA is a poor indicator of performance (by using cumulative, average abnormal returns as proxy). Ismail (2006) analyzes the superiority of EVA on UK market compared with other accounting measures. The results show that net operating profit after tax and net income outperform EVA and residual income in explaining stock returns for relative information content test. Biddle et al. (1997) examine whether EVA will have higher association with stock returns and firm values than traditional accounting earnings and find that earnings (EBEI) has the highest significant association with market-adjusted annual returns. Kyriazis and Anastassis (2007) examine the relative explanatory power of EVA with respect to stock returns and firm values similar to Biddle et al. (1997) but testing on emerging market, namely Athens Stock

Exchange in Greece. They also find that EVA does not appear to have stronger correlation with shareholder's value than other accounting variables (e.g. net income, operating income). However, O'Byrne (1997) documents that EVA can significantly explain more of the variations in market value among companies than earnings (Net Operating Profit after Tax (NOPAT), Free Cash Flows (FCF)). Ferguson et al. (2005) examine 65 firms that became Stern Stewart clients from July 1983 to March 1988 period and find that EVA adopters experience an increase in profitability performance relative to their peers after the adoption.

EVA introduced by Stern Stewart Company appears to be criticized by many researchers in term of its superior performance compared to other traditional accounting measures. Most papers have shown that EVA does not dominate other traditional accounting variables in the way it associates with abnormal stock returns in markets. This paper will focus on analyzing the value-relevance (information content) of EVA in mergers and acquisitions by examining whether EVA has explanatory power to measure the firm's performance that reflect in the takeover premium instead of using generally abnormal stock returns as a proxy for testing EVA. We will test EVA in three aspects by observing the

relationship between EVA and the premium received in takeover event separated into the view of target, bidding and combined firms.

3. Data and Methodology

Data used in this study include the data from financial statements of companies that engaged in mergers and acquisitions in UK market from 1991-2007. The mergers and acquisitions data are obtained from SDC. We use data from public target and bidding firms in UK. The initial sample of 1,082 deals (total 2,164 companies in target and bidding firms[10]) is reduced by 82 firms due to the lack of Datastream code. We are then use only data that satisfying the following general three standard conditions associated with the mergers and acquisitions data.

(1) Market value of bidding firms[11] must equal or exceed one million pound. This condition will illustrate the power and significant size of bidder engaged in takeover event.

(2) Deal value must equal or exceed 5% of the market value of bidder. This condition shows the value of target firms that are generally large and worth enough for bidder to acquire.

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[10] Some bidders may have acquired more than one firm and some targets may have been taken over multiple times. However, we identify them as separated transactions. For instance, when several acquisitions were made by the same bidder, the bidder is counted separately for each acquisition.

[11] Market value of bidding firm is standardized by; first, divide the market value of bidder by the ratio of FTALLSH index in the year which the transaction occurred (year t) and year 1991 (the benchmark year). Then we select only bidders with standardized market value exceeding one million pound. The purpose of this standardize is to eliminate the effect of the inflation through each year that may have an effect on market value.

(3) Toehold interest[12] or the pre-merger equity ownership in the target held by a bidder must be equal to or less than 30%. Toehold interests are taken from offer documents of the bidding companies.

After selecting the data constraint with their criteria, our sample is ended up with 670 firms (bidding + target firms). Then, we collect the data separated into dependent and independent variables. Accounting and market value data are available on Datastream.

3.1 Definitions of dependent and independent variables

There are three dependent variables, which are target premiums, acquirers' abnormal returns and combined returns. For target premiums, we define a target premium as a takeover premium because the gain from mergers transaction will transfer to the target firm according to the contract agreement. Therefore, we can use the word "target premium" or "takeover premium" interchangeably. We will follow Moeller (2005)[13] in measuring a target premium.

$$\text{Takeover premium} = \frac{\text{Price per share offered by bidder}}{\text{Target's share price twenty days prior to announcement}} - 1$$

For the price per share offered by bidder, we calculate through the deal value and use the multiple between the market value of target 20 days prior to the announcement date and percentage of share acquire as target's share price 20 days prior to the announcement date[14].

For acquirers' abnormal return, we measure the acquirers' abnormal percentage return by examining market reaction from the bidder stock price. Following Draper and Paudyal (1999), acquirer abnormal returns (AR_{it}) are estimated by using Market Model adjusted for abnormal return shown by the regression equation below;

$$AR_{it} = R_{it} - \infty\beta i - B_i R_{mt}$$

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[12] See Franks and Harris (1989), they have partitioned toeholds at a 30% threshold, since the UK takeover panel requires a bid for the entire company when a bidder's toehold interest exceeds this figure. This rule was introduced in the early 1970s presumably because it was thought that toeholds greater than 30% conveyed a purchasing advantage.

[13] For Moeller (2005), he uses target's share price six days prior to the announcement because he claimed that short window ensures that most of the return can be attributed to the mergers and acquisitions. However, we use twenty days prior to announcement in order to match with the event study applied in finding acquirers' abnormal returns by Draper and Paudyal (1999) which use UK data similar to this study.

[14] The announcement date is the day that the takeover news is publicly announced in the market. This paper captures the gain of merging firms around the announcement date that can be used to infer about the performance of EVA through the premium received around this period.

where R_{it} is the continuously compounded return[15] to bidding firm i on trading day t . R_{mt} is the continuously compounded return of the UK market on day t (proxy by FT All Share index). In addition, the market model regression parameters, α_i and β_i are estimated from the following market model;

$$R_{it} = \infty_i + \beta_i R_{mt} + \varepsilon_{it} \qquad\qquad t = -520, ..., -21$$

For the event studies (Brown and Warner (1985)), the parameter estimation period[16] is taken as starting from 500 working days (approximately 2 years) and finishing at 21 days prior to the announcement (-20 to 20 days). This method of measuring bidder abnormal stock returns can be viewed as the prediction error from the market model. Last but not least, combined returns is measured as the weighting in size of target and bidding firm between target abnormal return and acquirers' abnormal returns.

For the independent variables, there is CFO, EBEI, RI and EVA (four variables of each accounting performance measure) is defined below;

CFO (Cash Flows from Operation)

Cash flows from operation are obtained from the statement of cash flows or the statement of changes in financial position, depending upon the year of the observation. We use net cash flows from operating activities (WC04860) from Datastream.

EBEI (Earnings Before Extraordinary Items)

EBEI is net income before extraordinary items. We collect EBEI from net income before extraordinary items (WC01551) in Datastream. It can be computed from the following equation.

	EBEI	=	CFO + Accrual
where	CFO	=	net cash flow provided by operating activities.
	Accrual	=	total accruals related to operating (as opposed to investing or financing) activities, e.g., depreciation, amortization, $\triangle$ non-cash current assets, $\triangle$ current liabilities (other than notes payable and current portion of long-term debt), and $\triangle$ non-current portion of deferred taxes

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[15] Continuously compounded return is calculated by taking ln of Total Return Index (RI) obtained from Datastream of takeover year period (t) divided by the year before takeover year (t-1).

[16] Draper and Paudyal (1999) claimed that many event-studies use a shorter window of -10 to +10 days surrounding the event. However, the takeover process in the UK suggests that bidders may start building up their stake well before the announcement of bids and hence it is relevant to use a wider window (-20 to 20 days) that can cover the overall effect from takeover announcement, especially for the period prior to the announcement of bids.

RI (Residual Income)

Residual Income (RI) can be viewed as the original model, from which EVA is derived. Residual income can be computed in many forms as followed[17];

$$RI[18] \quad = \quad NOPAT[19] - (k* \text{ Capital})$$
$$RI \quad = \quad (ROA*Capital) - (k*Capital) \quad \text{or}$$
$$RI \quad = \quad NI - (\text{Cost of equity capital}*\text{Book value of equity}) \quad \text{or}$$
$$RI \quad = \quad EBEI + ATInt - (k*Capital)$$

where ATInt = the after-tax equivalent of book interest expense

k = the firm's weighted average cost of capital[20]

Capital = Stern Stewart's definition of assets[21] (net of depreciation) invested in going-concern operating activities, or equivalently, contributed an retained debt and equity capital, at the beginning of the period.

EVA (Economic Value Added)

EVA is Stern & Stewart's proprietary version of RI. Stern and Stewart attempt to improve RI by adjusting NOPAT and Capital that they think could be distorted by accounting method for measuring performance. According to Kyriasis and Anastassis (2007), EVA[22] can be estimated by the following relationship;

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[18] For the calculation of RI, we calculate following the EVA formula by excluding the Stern Stewart adjustments. We will use the definition of RI following Biddle et al. (1997) in this paper.

[19] NOPAT is the net operating profits after tax which separates operating activities from financing activities by adding back the after-tax effect of debt financing charges (interest expense).

[20] WACC can be calculated from the sum of weighting between the cost of debt and cost of equity. For the cost of debt, it is the sum of 3-month UK t-bill and the average five-year spread before the takeover year. The spread is the difference between the interest rate of the company debt (estimated from interest expense/total debt) and 3-month UK t-bill. For the cost of equity, it is derived from CAPM Model.

[21] We use total asset as capital.

[22] In this paper, we simply calculate EVA by not applying some adjustments because of the limitation in availability of data.

EVA $\quad = \quad$ NI + OIADJ - CAPCHG + STSTEWADJ

where $\quad$ NI $\quad = \quad$ Net Income for firm i

OIADJ $\quad = \quad$ Operating income adjustments (Operating income ([23]- Net Income) for firm i

CAPCHG $\quad = \quad$ k*Total assets

STSTEWADJ $\quad = \quad$ Stern Stewart adjustments[24] (Adjustments to profits- k*Adjustment to invested capital) of firm i

Adjustments to profits $\quad = \quad$ - interest tax shields (= tax rate*interest expense) + depreciation of goodwill[25] + taxes in extraordinary income + (-) change in deferred tax + R&D expense[26]

Adjustment to invested capital $\quad = \quad$ - accounts payable - accruals + depreciation of goodwill + R&D expense

We do not apply the adjustments of capitalization of operating lease, the conversion of LIFO to FIFO method and capitalization of marketing costs. This is because the relevant data are not reported in the financial statement provided in Datastream. For the adjustment of goodwill, goodwill in UK is permitted the immediate write-off to reserves. According to EVA, any reduction in goodwill understates capital or overstates EVA. In addition, goodwill is not amortized for EVA calculations. Any amortization of goodwill is added back to capital and operating profit. If goodwill was written off at the time of acquisition for companies that are still owned, that goodwill must be restored. We find the amortization of goodwill by subtract the impairment of goodwill (WC18225)

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[23] Operating income = Operating profits before taxes from balance sheet. Operating income represents the difference between sales and total operating expenses.

[24] For Stern Stewart adjustment, there are up to 164 adjustments in NOPAT and Capital Charge. According to Young (1999), most of the adjustments are in the form of what EVA's leading components (provisions, deferred taxes, and goodwill). The logic behind these adjustments is that when companies apply GAAP, certain items are charged to income, such as provisions, deferred taxes, and goodwill that artificially and misleadingly reduce stated capital. Young (1999) also concluded that in practice the simple implementation approach with limited adjustment outweigh the cost of increased complexity. Moreover, as claimed by Weaver (2001) which conducts the survey on the significance of adjustments and find that EVA adopters make only 19 adjustments on average. To conclude, we will make adjustments on EVA based on the availability of data provided in Datastream.

[25] We use the amortization of goodwill in Datastream as the depreciation of goodwill.

[26] We modify the adjustment of R&D by simply adding R&D expense occurred in each year back to the operating profit and capital.

from the amortization and impairment of goodwill (WC18224). No data is found in Goodwill expense. For deferred tax (WC03263), it exists whenever companies have timing differences between their taxable income and the book income recognized under GAAP. Adjustment is made in EVA calculation by adding the change in deferred taxes for the year to operating profit; that is ,add an increase and subtract a decrease(when deferred tax is the net liability). For taxes in extraordinary income, we find from Extraordinary items (Pre tax) (WC01601) - Extraordinary items (Post tax) (WC01253-WC01254) on Datastream. For research and development costs (R&D) that is claimed to be a common accounting adjustment, we cannot made the capitalization on them because capitalization of R&D requires data in useful live of each R&D expense in the companies to amortize this cost of the investments and some errors may be occurred in making their estimated useful lives. Although a number of other adjustments[27] are often made for EVA calculation beyond the abovementioned, we focus on only adjustment shown in the above EVA formula.

3.2 Relative information content test

Following Biddle et al. (1997), the relative information content test compares the ability of two competing sets of independent variables to explain a cross-sectional variation in the dependent variable. This test asks which measure has the greatest information content, then making mutually exclusive choices among alternatives (other measures) or ranking them. We apply this test by making comparison and ranking performance measures (EVA, Cash Flow from Operation (CFO), Earnings before Extraordinary Items (EBEI), Residual Income (RI)). We investigate which one of these measures can best explain the cross-sectional variation in takeover premium, acquirers' abnormal returns and combined returns around the announcement date. To test whether EVA has more value-relevance than other accounting measures, we will conduct two-tailed tests of the null hypotheses (comprising six pairwise comparisons) that CFO, EBEI, RI and EVA have equal relative information content:

H_0: The information content of measure x_j is equal to that of x_k

where x_j and x_k represent pairwise combinations from the set of performance measures: CFO, EBEI, RI and EVA. Rejection of H_0 is viewed as an evidence of a significant difference in relative information content. To test the hypotheses, we will use the following regression[28]:

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[27] For the adjustments, we will follow Young (1999) and Kyriasis and Anastassis (2007).

[28] Equation 1 is developed from the original ordinary least square in Biddle et al. (1997): $D_{,t} = b_0 + b_1 FE_{x,t} / MVE_{,t} + e_{i,t}$ where D_t is the dependent variable, a measure of abnormal return for time period t, FE_{xt} / MVE_{t-1} is the unexpected realization (or forecast error) for a given accounting measure X (e.g., CFO, EBEI, RI, EVA) scaled by the beginning-

$$takepre_{it} = b_o + b_1 X_{i,t} / BVA_{i,t-1} + b_2 X_{i,t-1} / BVA_{t-1} + e_{i,t} \qquad (1)$$

where

$takepre_{it}$[29]   is the dependent variable, a measure of takeover premium of firm i in period (year) t

$X_{i,t}$ is a given accounting measure X (e.g., CFO, EBEI, R, EVA) of firm i in period (year) t

$BVA_{i,t-1}$[30]   is the beginning-of-period book value of the firm's total assets

$e_{i,t}$ is a random disturbance term (under the usual assumption in OLS regression)

Equation 1 is the cross-sectional regression model. All three hypotheses are tested by comparing adjusted R^2 from four separate regressions (one regression for each performance measure). Then, we analyze p-values received from the result of two-tailed tests[31] of relative information content

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of-period market value of the firm's equity, MVE_{t-1} and e_t is a random disturbance term. The forecast error (FE_t) is the difference between the realized value of a firm performance measure and the market's expectation: $FE_t = X_{,t} - E(X_{,t})$. where $E(X_{i,t}) = \delta + \phi_1 X_{t-1} + \phi_2 X_{t-2} + ...$ The final equation that can be derived from substituting $FE_{x,t}$ in the main equation is $D_{,t} = b_0 + b_1 FE_{x,t} / MVE_{t-1} + b_2 FE_{x,t-1} / MVE_{t-1} + e_t$ that was limited to one-lag version to solve the problem of possible structural change across time.

[29] We will change dependent variables following three hypotheses: takeover premium, acquirers' abnormal returns and combined returns.

[30] In Biddle et al. (1997), they use MVE (Market Value of Equity) as a deflator to reduce heteroscadasticity in data but we use the book value of total assets instead in this paper. There are two main reasons why we choose to use book value of total assets following Powell and Stark (2005). First, the disadvantage of using market values is that they are a forward-looking measure, which incorporates the expectation view of investors on the company. Thus, market value may not be reflect the true value of the company in case of inefficient market. Second, Powell and Stark (2005) which do research in UK claimed that we could use book value of total assets as a deflator to solve the above problem because there is no goodwill included in book value of asset likes US. Hence, there is no need for adjustment in goodwill.

[31] Two-tailed p-values represent tests of null hypothesis that set to the meaning of no difference between pairwise comparisons of adjusted R-squares. We will compare R^2s and test the statistical significance of R^2 in each pairwise comparison of accounting measures. The hypothesis is set as the following:

$H_o : B'_1 N'_1 [I_n - M_1(M_1'M_1)^{-1} M'_1] N_1 B_1 = B'_2 N'_2 [I_n - M_2(M'_2 M_2)^{-1} M'_2] N_2 B_2$

where B is a k-vector of regression coefficients. To assess the relative information contents of subsets of predictor variables M_1 and M_2, define N_1 as the columns of M not in M_1 and N_2 as the columns of M not in M_2. Define B_1 as the subset of B for N_1 and B_2 as the subset of B for N_2. This null hypothesis used to compare the relative information content of two subsets of predictors, M_1 and M_2. Moreover, this is nonlinear hypothesis in quadratic forms of regression coefficients. It can be tested using Wald test of estimated coefficients that we received the valuable supports from Professor Gary Biddle in SAS program for testing this comparisons of adjusted R-squares.

(R^2 comparison) in each pairwise comparison. Biddle et al. (1995)[32] uses the original fundamental of statistical test in relative information content by using a lack-of-fit measure defined as the average of the sum of squared residuals and the sum of squared prediction errors, a nonlinear null hypothesis is obtained that involves quadratic form of regression coefficients. By applying this method claimed by Biddle et al. (1995), the nonlinear hypothesis (null hypothesis) in quadratic forms of regression coefficients can be derived and then can be tested using the Wald test[33].

4. Results

4.1 Descriptive Statistics

We separate the result into 3 panels of Table 1 following the methodology and hypothesis testing. All independent variables are winsorized to 4 standard deviations from the median. Data presented in Panel A1 of Table 1 are data for testing hypothesis 1(Target side) in relative information content test. CFO has the lowest standard deviation and has the highest mean and median. RI has negative value. All correlations are positive and CFO has the highest significantly positive correlation with target premium (TP).Target abnormal return (Return) has been created to consistently compare with acquire

abnormal return. The correlations between each accounting measure and target abnormal return are insignificantly positive.

Data presented in Panel A2 of Table1 are data for testing hypothesis 2 (Bidder side) in relative information content test. CFO still has the lowest standard deviation among the four performance measures. CFO still has the largest mean and median followed by EBEI, EVA and RI that is consistent with the result of Biddle et al. (1997). The residual income (RI) has the lowest mean and negative value the same as Kyriazis and Anastassis (2007) that reasoned this as because of the high positive values of the Stern Stewart adjustments in operating profits and invested capital. EVA has a positive mean value and the highest standard deviation. All correlations among these independent variables are all significantly positive. These findings can imply that EVA does not differ much from other accounting performance measures. On the other hand, the correlations between each accounting measure and acquirers' abnormal returns (AR) is insignificantly negative except EVA is insignificantly positive correlated with acquirers' abnormal returns (AR). According to our research hypotheses, the positive correlations between EVA and those three dependent variables are expected so as to conclude the

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[32] Follow Biddle et al. (1995), this statistical test is claimed to be the favorably method for testing relative information content compared with alternative tests provided in Davidson and MacKinnon (1981) and Vuong (1989). For the detail and background of this test, please see Biddle et al. (1995).

[33] Wald test is conducted by using SAS program.

additional value-relevance of EVA in M&As. However, this positive correlation between EVA and acquirers' abnormal returns shows weakly support to infer about the superior performance of EVA.

Data presented in Panel A3 of Table1 are data for testing hypothesis 3 (combined side) in relative information content test. Combined CFO still has the largest mean and median the same as each bidder and target side but the lowest standard deviation. Combined EVA shows the significantly largest positive correlation with the combined returns.

In overall, these descriptive statistics table leave us many important points. Only RI has negative values. This seems reasonable because RI may receive an effect from the adjustment part of EVA, which can be observed in change from the positive sign of EVA to negative sign in RI. As focused on the correlations, the correlations between each accounting measure are significantly positive. This can imply that the trend of explanatory power of each accounting measures seems to be in the same way. However, the correlations between each dependent variable and each independent variable show insignificantly relationships except the clearly significant positive relationship between CFO and target premium (TP).

Table 1 Panel A1

Descriptive statistics on the dependent and independent varible

in relative information content tests for target [a]

	Dependent variable		Independent variable			
	TP_t (%)	$Return_t$ (%)	CFO_t	$EBEI_t$	EVA_t	RI_t
No. of Observation	465	588	247	303	196	270
Descriptive Statistics						
Mean	54.283	0.440	0.054	0.029	0.006	-0.024
Median	23.021	0.365	0.056	0.042	0.011	-0.007
Std Dev.	159.037	0.575	0.096	0.102	0.120	0.106
Correlations [b]						
CFO_t	.199**	0.026	1.000			
$EBEI_t$	0.101	0.016	.610***	1.000		
EVA_t	0.087	0.128	.286***	.393***	1.000	
RI_t	0.062	0.129	.424***	.607***	.812***	1.000

Table 1 Panel A2

Descriptive statistics on the dependent and independent variable

in relative information content tests for bidder [a]

	Dependent variable	Independent variable			
	$Return_t$ (%)	CFO_t	$EBEI_t$	EVA_t	RI_t
No. of Observation	609	527	625	408	534
Descriptive Statistics					
Mean	0.000	0.050	0.025	0.005	-0.027
Median	-0.008	0.053	0.039	0.005	-0.013
Std Dev.	0.385	0.108	0.118	0.122	0.116
Correlations[b]					
CFO_t	-0.075	1.000			
$EBEI_t$	-0.065	.676***	1.000		
EVA_t	0.045	.404***	.413***	1.000	
RI_t	-0.005	.530***	.644***	.811***	1.000

Table 1 Panel A3

Descriptive statistics on the dependent and independent varible

in relative information content tests for combined (target + bidder)[a]

	Dependent variable	Independent variable			
	Combined $Return_t$ (%) (Return)	Combined CFO_t	Combined $EBEI_t$	Combined EVA_t	Combined RI_t
No. of Observation	544	231	283	156	232
Descriptive Statistics					
Mean	0.107	0.060	0.037	0.011	-0.015
Median	0.083	0.062	0.043	0.007	-0.008
Std Dev.	0.357	0.090	0.091	0.105	0.094
Correlations[b]					
Combined CFO_t	-0.069	1.000			
Combined $EBEI_t$	-0.092	.647***	1.000		
Combined EVA_t	.175**	.293***	.370***	1.000	
Combined RI_t	0.083	.452***	.580***	.805***	1.000

[a] All variables are winsorized +/- 4 standard deviation from the median. All independent variables are deflated by the book value of total asset at the takeover year t.

[b] All correlations are generated and tested by using Spearman test in SPSS.***,**,* denote the statistical significance at the 0.01 0.05 and 0.1 level respectively.

[c] Combined return is conducted from the weighting by firm size between target abnormal return and acquirer abnormal return

4.2 Relative information content test

Relative information content is assessed by comparing adjusted R^2 from four separate regressions (CFO, EBEI, RI and EVA) and tests of the null hypothesis of no difference between pairwise comparisons of adjusted R^2. Panel A of Table 2 shows the results of adjusted R^2 of the regressions of target premium on each accounting measure under comparison. The highest R^2 is observed in the regression with CFO as the explanatory variable (adjusted R^2 = 3.55%), which is followed by EBEI (adjusted R^2 = 1.32%), while RI (adjusted R^2 = -0.36%) and EVA (adjusted R^2 = -1.89%[34]) appear to have the smallest explanatory power with respect to target premium. The results of the Wald test of Biddle et al. (1995)[35] are presented on p-value in parentheses for each of the six possible pairwise comparisons. All p-value results in Panel A suggest that the explanatory power of each performance measure does not appear to outperform each other significantly. The results imply the less value-relevance of EVA compared with other traditional performance measure associated in takeover premium. This can be interpreted that the high performance target firm (high EVA) tend to receive low takeover premium. Therefore, EVA cannot act as the good indicator of measuring the target firm performance.

Panel B of Table 2 presents the results of adjusted R2 of the regressions of acquirers' abnormal returns on each accounting measure under comparison. An examination of the R^2 reveals that EVA appears to have the greatest relative explanatory power (adjusted R^2 = 2.13%) over the other performance measures. EVA is followed by CFO (adjusted R^2 = 0.1%). EBEI comes third (adjusted R^2 = 0%), while RI seems to have the least explanatory power with respect to acquirers' abnormal returns (adjusted R^2 = 0%). However, this difference in adjusted R^2 (shown by p-value between EVA, CFO, EBEI and RI) is not significant. Therefore, this result gives the weak support on the argument that EVA has greater information content or superior value-relevance than other accounting variables. In other words, this implies that bidder can best choose EVA to be the performance tool in measuring their firm.

Panel C of Table 2 shows the results on combined return (Combined acquirers' abnormal returns with targets' abnormal returns) as the dependent variable. Combined CFO gives the

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[34]   In the case of adjusted R^2, when it turns out to be negative in an application, its value is taken as zero. This result creates the implication that EVA has no explanatory power in the dependent variable and suggests that EVA quite has no value-relevance or less value-relevance in comparison to other accounting measures variables. See Gujarati (2003), P.218. Adjusted R^2 has taken into account the number of independent variables. The negative sign can occur and show that our model is worse than our expectation (or mean of our whole regression).

[35]   This Wald test is not the same test as Wald test provided in Eviews.

highest R^2 (R^2 = 4.82 %), followed by combined EBEI (R^2 = 2.03%), combined EVA (R^2 = 0%), combined RI (R^2 = -0.16%) respectively. This seems reasonable because CFO in takeover premium and acquirers' abnormal returns are outperform other accounting measures. However, the tests in the difference between adjusted R^2 in each independent variable are not significant, suggesting that we cannot claim in the superior performance of each independent variables over others in combined returns.

In summary, we find that in all results in terms of this relative information content except acquirers' abnormal returns, CFO appear to insignificantly outperforms EBEI, EBEI insignificantly outperforms RI and EVA. EVA does not outperform the other traditional accounting measures in explaining takeover premium. That implies less value-relevance of EVA in target premium and combined returns. This result contrasts with the previous results of Biddle et al. (1997) which find that CFO has the lowest R^2 in correlation with abnormal stock returns but agree on the way that EVA is not outperform other accounting measures. Similarly, Kyriazis and Anastassis (2007) reports that EVA appears to have the smallest explanatory power associated with stock returns. Surprisingly, EVA obtains the highest R^2 in acquirers' abnormal returns. Its rank in R^2 shows EVA to be the highest one and leave the other

variables remain the same order. This situation is consistent with the signal shown about the significantly positive correlation between EVA and acquirers' abnormal returns. From the abovementioned results, EVA cannot outperform other accounting measures in target premium and combined returns. Although EVA has the highest adjusted R^2 in acquirers' abnormal returns, the difference between each accounting measure in information content with premium received in M & As is not significant. In other words, all four accounting measures have equal information content.

5. Robustness Checks

Due to the varying degree of intangibility[36], the correlation between EVA and premium may vary across industries. Therefore, we conduct this factor to test the sensitivity of EVA across industries. Industries that have high number of intangible assets on their balance sheet will have to make large adjustments on EVA. It creates the possibility that the result from using the evaluation tool as EVA will significantly vary from using the traditional measures. This will have an effect on the superiority of EVA over traditional measures and may change the initial findings. As a result, we will take an industry effect into account and consider whether the results are sensitive and vary across industries. We will illustrate and compare test in relative information content across industries. Hence, the

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[36] The main and common adjustment of Stern Stewart is to deal with the problem in intangible asset (R&D, Goodwill) that can distort the invested capital and operating income.

Table 2 Panel A

Tests of the relative information content of EVA,RI,EBEI and CFO;

Takeover Premium as Dependent variables^

	Relative information content						
No. of Observations	155		215		183		108
Rank order of R^2	CFO	>	EBEI	>	RI	>	EVA
Adj.R^2	0.035		0.013		-0.004		-0.019
Prob(F-statistic)	(0.024)**		(0.091)*		(0.509)		(0.994)
p-value		(0.412)		(0.507)		(0.819)	
			(0.325)		(0.248)		
					(0.315)		

^Underlying equation is $D_{it} = b_0 + b_1 X_{i,t}/BVA_{i,t-1} + b_2 X_{i,t-1}/BVA_{i,t-1}+e_{i,t}$ where D_{it} is the takeover premium , $X_{i,t}/BVA_{i,t-1}$ is a given accounting measure X (e.g., CFO,EBEI,RI ,EVA) of target firm i in takeover year t scaled by the beginning-of-period book value of the firm's total assets. The first row of each panel shows the number of observations in each one of accounting measure as the independent variable. The second and third rows represent the rank order of R^2 from the highest (on the left) to lowest (on the right) and the value of R^2 for each regression. In the fourth row, the p-value of F-statistic test is presented to show the significance of R^2 in each regression (accounting measure). For the last row, p-value is obtained from two-tailed statistical tests of relative information content (Wald test) showed in parentheses for each of the six possible pairwise comparisons of adjusted R^2. P-value rows begin with the first row presented p-value for comparison between first and second ranked measures, second and third ranked measures and third and fourth ranked measures. The second row is the p-value for comparison between first and third ranked measures, second and fourth ranked measures. The last row is for first and fourth ranked measures. ***, **,* denote the statistical significance at the 0.01 0.05 and 0.1 level respectively.

Table 2 Panel B

Tests of the relative information content of EVA,RI,EBEI and CFO;

Acquirer abnormal return as Dependent variables^

	Relative information content						
No. of Observations	309		608		569		483
Rank order of R^2	EVA	>	CFO	>	EBEI	>	RI
Adj.R^2	0.021		0.001		0		0
Prob(F-statistic)	(0.014)**		(0.295)		(0.347)		(0.379)
p-value		(0.454)		(0.978)		(0.998)	
			(0.841)		(0.966)		
					(0.432)		

^ The underlying equation is the same as Table 1 Panel A except the dependent variables changed to acquirer abnormal return and X is the accounting measure of bidding firms.

Table 2 Panel C
Tests of the relative information content of EVA,RI,EBEI and CFO;
Combined return as Dependent variables^

	Relative information content						
No. of Observations	184		256		117		213
Rank order of R^2	CFO	>	EBEI	>	EVA	>	RI
Adj.R^2	0.048		0.02		0		-0.002
Prob(F-statistic)	(0.004)***		(0.028)**		(0.367)		(0.437)
p-value		(0.819)		(0.85)		(0.793)	
			(0.38)		(0.882)		
				(0.548)			

^ The underlying equation is the same as Table 1 Panel A except the dependent variables changed to combined return and X is the combined accounting measure of target and bidding firms.

M&A data[37] used in this paper will be separated into two industry groups (high intensity[38] R&D expenditure and non-high intensity R&D expenditure industry) based on R&D intensity as criteria because R&D act as the main driver of EVA and play an important role in the large part of Stern Stewart's adjustment[39]. According to UK industry research[40], the sectors[41] with typically high R&D intensity are the following five sectors: pharmaceuticals & biotechnology, aerospace & defence, software, &

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[37] M&As data used in this thesis comes from UK data. According to R&D scoreboard website, it uses 850 UK companies that invest the most in R&D expenditure and then conclude them in the way that separating those companies into sectors. Therefore, we use its criteria to separate our sample firms into two groups (high intensity (five sectors) and non-high intensity R&D expenditure industry) based on the information given in this website. (Source: http://www.innovation.gov.uk/rd_scoreboard/). The R&D data was collected from the audited annual report of each UK companies.

[38] Intensity = R&D Expenditure/ Sales (Source: R&D Scoreboard).

[39] Hatfield (2002) examines the effect of R&D on EVA accounting and suggest ways in which R&D can be used to drive EVA growth. Since R&D has a relatively large cost, the managers might be tempted to cut R&D to boost up the net operating profit, which is the main component in EVA calculation.

[40] See the 17th annual edition of the R&D Scoreboard, which is published jointly by the department for innovation, Universities& Skills (DIUS) and the department for Business, Enterprise& Regulatory Reform (BERR) or http://www.innovation.gov.uk/rd_scoreboard.

[41] For sectoral classifications, we use FTSE (Financial Times Stock Exchange Index) for classification.

computer services, fixed line telecommunications and automobiles & parts, which together accounted for almost two thirds of R&D[42].

In table 4 reports the results of relative information content test classified by two groups of firms (high and non-high R&D intensity expenditure industries).Not surprisingly, EVA exhibits the high largest R^2 for the high R&D intensity part for target premium in panel A, which exceed CFO used to have highest R^2 . However, none of the performance measures differs significantly in relative information content. The result of non-high R&D intensity group of takeover premium is the same as the initial result.

Surprisingly, RI has the highest R^2 in high R&D intensity session for acquirers' abnormal returns in panel B and EVA turns to have the less explanatory power variables. While CFO is not dominate other performance measures in this part,

CFO still has the adjusted R^2 in second rank but it is not significantly differ from the first rank in overall result. For non-high R&D intensity for acquirers' abnormal returns, EBEI has the highest R_2 and there is no significance in the difference in R_2 in each pairwise comparison.

From the abovementioned results, there is no evidence to support that EVA has the superior performance than other traditional accounting measures. In only one case in acquirers' abnormal returns that EVA has the highest R^2 but this superior R^2 is not statistically significant compared to other measures. In contrast, adjusted R^2 is highest for CFO in the remaining comparisons although CFO insignificantly outperforms EVA. In terms of incremental information content, the analyses provide that only CapChg and CFO that add the incremental information content. This shows the weakly evidence to support the superiority of EVA performance.

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[42] Source: 2007 R&D Scoreboard (an investigation of financial performance of the top UK and global corporate investors in R&D and the data comes from the audited company accounts). The scoreboard is an international league table of the companies investing most in R&D. They summarize the 2006 data on investment in R&D and financial performance of the 850 most active UK companies (including foreign-owned companies whose R&D is conducted and reported in the UK)

Table 4 Panel A

Tests of the relative information content of EVA, RI, EBEI,CFO;

Partitioned by R&D intensity across industries and Takeover Premium as Dependent variables^

Relative information content						
High R&D intensity						
No. of Observation	15		20		26		23
Rank order of R^2	EVA	>	CFO	>	EBEI	>	RI
Adj.R^2	0.277		0.25		0.125		0.071
Prob(F-statistic)	(0.057)*		(0.034)**		(0.082)*		(0.185)
p-value		(0.75)		(0.916)		(0.451)	
			(0.055)		(0.552)		
				(0.113)			
Non-high R&D intensity						
No. of Observation	144		199		169		101
Rank order of R^2	CFO	>	EBEI	>	RI	>	EVA
Adj.R^2	0.036		0.013		-0.006		-0.02
Prob(F-statistic)	(0.027)**		(0.037)**		(0.632)		(0.976)
p-value		(0.426)		(0.549)		(0.89)	
			(0.387)		(0.272)		
				(0.32)			

^From the remaining 670 deals, which satisfy all criteria, there are 603 target firms and 693 bidding firms following industry data. In this number separated into 70 and 64 high R&D target and bidding firms respectively. High R&D intensity expenditure industries are composed of five sectors: pharmaceuticals & biotechnology, aerospace & defense, software & computer services, fixed line telecommunications and automobile & parts. ***, **,* denote the significance level of 0.01, 0.05 and 0.1 respectively.

Table 4 Panel B
Tests of the relative information content of EVA, RI, EBEI,CFO;
Partitioned by R&D intensity across industries and Acquirer abnormal return as Dependent variables^

Relative information content							
High R&D intensity							
No. of Observation	62		59		81		45
Rank order of R^2	RI	>	CFO	>	EBEI	>	EVA
Adj.R^2	0.153		0.15		0.091		0.082
Prob(F-statistic)	(0.003)***		(0.004)***		(0.009)***		(0.062)*
p-value		(0.543)		(0.5)		(0.098)	
			(0.544)		(0.415)		
				(0.136)			
Non-high R&D intensity							
No. of Observation	512		389		281		440
Rank order of R^2	EBEI	>	CFO	>	EVA	>	RI
Adj.R^2	0.016		0.007		0.006		0.005
Prob(F-statistic)	(0.006)***		(0.094)*		(0.158)		(0.135)
p-value		(0.596)		(0.977)		(0.402)	
			(0.952)		(0.642)		
				(0.371)			

^From the remaining 670 deals, which satisfy all criteria, there are 603 target firms and 693 bidding firms following industry data. In this number separated into 70 and 64 high R&D target and bidding firms respectively. High R&D intensity expenditure industries are composed of five sectors: pharmaceuticals & biotechnology, aerospace & defense, software & computer services, fixed line telecommunications and automobile & parts. ***, **,* denote the significance level of 0.01, 0.05 and 0.1 respectively.

6. Conclusion

This study investigates the value-relevance of EVA in mergers and acquisitions by answering the research question of "is there any correlation between a firm's EVA and the premium received in takeover event over traditional accounting measures". The empirical evidence shows that EVA does not outperform other accounting measures in terms of relative information content[43]. In relative information content test, CFO can best describe

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[43] We also test the value-relevance of EVA in the incremental information content test. Its result shows the weakly support of the superiority performance of EVA. For detail, please see our thesis on the topic of "Value Relevance of EVA in Mergers and Acquisitions" submitted in Department of Banking and Finance, Chulalongkorn University.

the variation in takeover premium and combined returns. Although EVA appears to have the potential to do a better job in explaining acquirers' abnormal returns, its superior performance is not statistically significant. As a result, there is not enough evidence to conclude that EVA provides the superior performance compared to other traditional accounting performance measures in mergers and acquisitions. It seems that the unadjusted accounting measures are more closely correlated with premium received in M&As than EVA.

There are many possible explanations why EVA does not outperform other traditional accounting measures. First, the market may see through various accounting conventions differently when calculating EVA than Stern Stewart does[44]. It also suggests that the market may place higher reliance on audited accounting earnings than the un-audited EVA model. Second, our results are consistent with the existing literature, which find that accounting-based information explains little of variation in stocks returns between firms. Those papers receive relatively low adjusted R^2 suggesting that 80-90% of the variation in stock returns appears to be attributed to non-earnings-based information. This is consistent with our results where nearly 90% of the 670 companies' takeover premium cannot be accounted for the EVA.

This evidence suggests that if firm desires to align the organizational performance (e.g. EVA, CFO, Earnings) with stock returns, companies may be disappointed and should find or develop the new

performance measurement tool. Third, for many decades, the research on the stock market suggests the idea of no single determinant, which can be relied upon to profitably predict the market. Therefore, it easily implies that manager should consider many performance measurement tools together in any decision-making of the company instead of relying only on any particular tool. As for example in our result, EVA is neither the only performance measure to tie the stock returns on nor a completely integrated one.

This study leaves several areas for future research. First, since we use takeover data from UK, it would be interesting to test on other markets to offer an out-of-sample test since there is surprisingly not many existing study on other markets. Second, it is possible that with the notion of "un-adjusted accounting measures myopia", in other words, the managers or market participants will get used to with the un-adjusted accounting measures will cause the bias in viewing EVA. We suggest that in future studies as more data become available, it possible to be able to assess whether the market participants have come to appreciate EVA, which probably may reflect in beneficial situation that firms would choose to disclose EVA rather than un-adjusted accounting measures. In our study, we focus on all firms engaged in M&As in UK. It opens the new issue for future studies in assessing whether the manager (related to takeover event) have come to appreciate EVA so as to find the new evidence in the superior of EVA.

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[44] Evidence from Chen and Dodd (2001)

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