

Lasse Niemi  
Hannu Ojala  
Tomi Seppälä

# Misvaluation of takeover targets and auditor quality

HELSINGIN KAUPPAKORKEAKOULU  
HELSINKI SCHOOL OF ECONOMICS

W-450



Lasse Niemi\* – Hannu Ojala\* – Tomi Seppälä\*\*

# Misvaluation of takeover targets and auditor quality

\*Department of Accounting and Finance

\*\*Department of Business Technology

June

2008

HELSINGIN KAUPPAKORKEAKOULU  
HELSINKI SCHOOL OF ECONOMICS  
PL 1210  
FI-00101 HELSINKI  
FINLAND

© Lasse Niemi, Hannu Ojala, Tomi Seppälä and  
Helsinki School of Economics

ISSN 1235-5674  
(Electronic working paper)  
ISBN 978-952-488-255-2

Helsinki School of Economics -  
HSE Print 2008

# Misvaluation of takeover targets and auditor quality

Lasse Niemi<sup>a</sup>, Hannu Ojala<sup>b,\*</sup>, and Tomi Seppälä<sup>c</sup>

<sup>a</sup> <sup>b</sup> *Department of Accounting and Finance, Helsinki School of Economics, Finland*

<sup>c</sup> *Department of Business Technology, Helsinki School of Economics, Finland*

---

## Abstract

Misvaluation may be a significant driver of the takeover market (Dong et al., 2006). Motivated by Titman and Trueman (1986) and Teoh and Wong (1993), we examine the role of auditor quality in the misvaluation of takeover targets. Given that firms audited by higher quality auditors (BigN) have higher financial statement quality, those target firms should be less undervalued than other target firms. We argue that this undervaluation that arises from information asymmetry between insiders and outsiders of the firm, is reduced in the takeover process as before making the takeover bid, the bidder is likely to analyse the prospects of a potential takeover target very closely. If BigN client firms are less undervalued prior the takeover than other target firms, there should be weaker market reaction to the takeover announcements when their true value is revealed to the market through the takeover announcement. Consistent with this, using the sample of over 1300 US takeover offers and their matched pairs from 1990 to 2005, we find that non-BigN targets are undervalued compared to non-target non-BigN client firms whereas we find no evidence suggesting that BigN targets are undervalued prior the takeover announcement. More importantly, our univariate and multivariate tests show that non-BigN targets provide larger cumulative abnormal returns than BigN targets, indicating a stronger market reaction to non-BigN takeover announcements. Consistent with the previous studies showing that BigN audited firms going public experience less underpricing compared to other IPO-firms, our findings suggest that those BigN client firms that become takeover targets, are less underpriced than their non-BigN counterparts.

**Key words:** *Audit quality, market efficiency, takeovers*

---

\* Corresponding author, email: [firstname.lastname@HSE.fi](mailto:firstname.lastname@HSE.fi)

## 1. INTRODUCTION

In a McKinsey report, Christofferson et al. (2004) suggest that on average acquirers pay sellers all of the value created by the merger in the form of a premium that ranges from 10 to 35 percent of the target company's preannouncement market value. Van Horne (1998) suggests that target company returns run around 30 percent on average during the last few decades, and premiums as high as 100 percent have occurred.

This study investigates the effect of auditor choice on the firm valuation in a business takeover. More specifically, we examine whether the market value of takeover targets differs in a systematic way between different types of auditors. We attempt to capture the systematic valuation differences by measuring the firm value of takeover targets preceding the takeover announcement and the cumulative abnormal return around the announcement. The aim of our empirical investigation is to be able to make inferences whether auditor quality makes a difference in a market value of the firm in a systematic way.

Prior literature supports the view that a privately held firm going public can decrease the level of uncertainty of future prospects, and consequently the level of underpricing of her shares, through auditor choice (e.g. Beatty, 1989). There are several possible explanations why this should be the case, but the common thread to all of these explanations is that markets assess some providers of audit services more credible than others. In other words, that the degree of credibility that is attached to the auditor's reputation capital, is not fixed to the membership of the profession but varies across audit firms.

It may well be that the impact that auditor choice has on firm value is not limited to the event when a firm goes public, that is, initial public offerings (IPOs). For example, it seems that the extent to which new earnings information is capitalized in the stock price depends on the auditor choice (the level of perceived auditor quality) (Teoh and Wong, 1993).

We believe that if systematic differences in auditee firm values continue to exist subsequent to IPO, business takeovers provide a good setting to observe those differences, if any. This idea is motivated by the recent study of Dong et al. (2006) which finds evidence supporting the view that misvaluation is one of the reasons for a takeover. This means that some market participants are better informed about a true firm value of a takeover target and pay less for the firm than its true value. If this is true, it is interesting to examine whether this misvaluation interacts with auditor choice in any systematic way. We attempt to shed a light on this issue as follows.

First, we measure firm value of takeover targets before the announcement and compare that to the value of similar non-takeover firms. We do that separately for the largest leading international audit firms and other auditors (hereafter, BigN and non-BigN auditors).

Second, we examine whether the abnormal returns enjoyed by the shareholders of non-BigN audited takeover targets are higher than those of BigN audited takeover targets. Building on Dong et al. (2006), we use price-to-book (hereafter  $P/B$ ) and price-to-value (hereafter  $P/V$ ) as measures of the degree of firm undervaluation.

Our empirical results suggest that non-BigN audited takeover targets are undervalued prior to the takeover bid compared to non-takeover firms. This position is supported by the lower  $P/B$ -ratio of non-BigN audited takeover targets compared to the  $P/B$  ratio of non-BigN audited firms that do not end up as a takeover target. However, we could not find the same hypothesized evidence regarding BigN target firms. Our empirical evidence also suggests that cumulative abnormal returns of non-BigN audited takeover targets exceed that of BigN audited takeover targets.

The remainder of this paper is organized as follows. Section 2 reviews relevant prior literature and develops the hypotheses. The data used in the empirical tests are explained in

Section 3, followed by research design in Section 4. Section 5 describes the empirical results. Section 6 concludes the study.

## **2. PRIOR LITERATURE AND HYPOTHESES DEVELOPMENT**

Prior literature on corporate control has largely focused on the characteristics of acquirer firm, on the relation of acquirer and target, or on target characteristics, such as size and industry-membership (Berger and Ofek, 1996; Bradley et al., 1988; Dong et al., 2006; Grossman and Hart, 1980; Jensen, 1986; Moeller et al., 2004; Roll, 1986; Shleifer and Vishny, 2003). Motivated by the studies on the role of auditor quality as a signal of the true firm value (Balvers et al., 1988; Beatty, 1989; Garner and Marshall, 2005; Titman and Trueman, 1986), we link these two literatures by focusing on the role of auditor quality in valuation of the takeover target firms.

Our investigation on the role of audit quality on the formation of target premiums in a business takeover rests on the assumption that BigN audit firms supply higher quality audits than other audit firms. DeAngelo (1981) proposes that the auditor's investments (start up costs) in the client relationships enable the incumbent auditor to earn client-specific quasi-rents and that these quasi-rents represent the collateral that is lost if 'promises' are not kept (i.e. audit failure). Thus, auditors with a larger number of clients possess greater total collateral and consequently have more to lose in audit failure (DeAngelo, 1981). Our assumption on the higher quality of BigN audit firms is supported by a bulk of empirical research focusing on quality differences or perceptions of it between the BigN and non-BigN firms. For example, BigN firms are associated with more accurate reports and more informative signals of financial distress (Petroni and Beasley, 1996; Lennox, 1999), lower litigation activity (Palmrose, 1988), and their clients' financial statements are associated

with higher compliance with GAAP disclosure requirements (e.g. Krishnan and Schauer, 2000). Also, larger audit firms are associated with better ability to mitigate agency costs: clients of those brand name auditors are associated with larger earnings response coefficients (Teoh and Wong, 1993), and they are less under-priced in initial public offerings (IPOs) (Beatty, 1989; Firth and Smith, 1992). In line with this, companies with higher demand for audit quality arising from higher agency costs are found more likely to hire these brand name audit firms (Francis and Wilson, 1988; Johnson and Lys, 1990; DeFond, 1992). Correspondingly, the BigN auditors are found to charge higher fees than other suppliers of audit services (Yardley et al., 1992; Walker and Johnson, 1996; Moizer, 1997; Taylor and Simon, 1999).

An inefficient market is one of the key takeover explanations (Dong et al., 2006). According to this explanation, the undervaluation of a firm in equity market triggers the takeover bid. Following this line of reasoning, we set the first hypothesis:

**H1: BigN and non-BigN audited takeover targets are undervalued compared to firms that are not targets of a takeover.**

Prior literature (e.g. Titman and Trueman, 1986; Teoh and Wong, 1993) suggests that the BigN-audited financial information is more accurate than that of non-BigN firms, and that BigN amplifies the impact that ‘good news’ have on markets. For example, Teoh and Wong (1993) found that the stock market reaction to BigN client’s earnings surprises was greater than that of other firms.

Building on Titman and Trueman (1986) and Teoh and Wong (1993) we argue that because of less reliable and accurate financial information, non-BigN firms are more ‘opaque’ than BigN audited firms and hence they should be more undervalued than BigN



clients, *ceteris paribus*. Following these suggestions, we posit that non-BigN audited takeover targets are *initially* more undervalued than BigN-audited takeover targets. However, in acquisitions, acquirers are likely to have an access to target firm's private information not available to other outsiders, and hence acquirers potentially yield more accurate valuations than equity market as a whole. Given that non-BigN client firms are more 'opaque' than BigN clients, and that takeover targets are undervalued due to information asymmetry between outside investors and corporate insiders, we should observe higher acquisition premia to the shareholders of non-BigN audited takeover targets than that of BigN-audited takeover targets. Accordingly, we set the second hypothesis:

**H2: The cumulative abnormal returns of non-BigN audited takeover targets are higher than those of BigN audited takeover targets.**

### 3. SAMPLE SELECTION

The analysis of this paper retrieves the sample of firms and data on variables from Securities Data Corporation (SDC) database and Thomson One Banker. Thomson One Banker is an online database with financial data available from Worldscope, Compustat, I/B/E/S, and Datastream databases. The sample selection criteria used in this study aim to enhance the power of statistical tests while maintaining sufficient generalizability of the results. The results of the sample selection are reported in Table 1.

Table 1. Sample Selection

Selection criteria	Takeover target firms
All US takeover targets that meet the data requirements in 1990-2005 required for the examination of the hypothesis	2,500
Problems with auditor data	-52
Missing time series data	-34
Sample for preliminary regressions	2,414
Outliers	-31
<i>Final sample</i>	2,383

---

Table 1 describes the data selection steps. In the first data step, we identify all active and non-active listed US takeover target firms in the Securities Data Corporation (SDC) data base, with auditor-code and share price one day before and after takeover bid announcement. We couple the share price data with Morgan Stanley, US total market index (from Datastream database) when we compute abnormal returns. We include in the examination years from 1990 to 2005. After running a preliminary regression with preliminary samples, those observations indicated by the Belsley, Kuh, and Welsch (1980) diagnostic as an influential observation (absolute value of studentized residual greater than 3, or Cook's D statistic greater than 1) were removed.

---

As Table 1 shows, we start the collection of data by identifying all US takeover targets in 1990-2005 from Securities Data Corporation (SDC) data base that include the following data: listed in a stock exchange, share price available one business day before and after the takeover announcement, and auditor code available. This procedure generates 2,500 observations. We review the auditor codes and classify takeover targets to BigN audited and non-BigN audited firms. We delete 52 observations because in the review process of auditor codes, we observe that those observations have an auditor labeled as “in-house”. For the computation of abnormal earnings, we couple the share price data from SDC with MSCI US

total market index that we obtain from Datastream database. In this data step, we lose 34 observations with missing time series information.

After these data steps, for the examination of the hypotheses, we maintain a preliminary sample of 2 414 takeover bids (target firms). As a final data step, observations were removed if the Belsley, Kuh, and Welsch (1980) diagnostic indicated that they were influential (the absolute value of studentized residual greater than 3 or Cook's D statistic greater than 1). This leaves a final sample of 2 383 takeover bids (target firms).

For the examination of H1 we construct a paired sample. We start the construction of the paired sample by identifying 1 898 takeover targets that possess the required pairing information: P/B-ratio, market value of equity (four weeks before announcement), an existing auditor code, announcement year, primary Standard Industrial Code (we use two-digit SIC code in pairing the observations). Next, we retrieve from Compustat and Worldscope all observations that possess the paired data required (less the firms in our takeover target sample) and use those (38 770 firm-years) as potential pairs. If there is more than one potential pair, we select the pair using a random selection. However, we require a unique pair for each takeover target; we do not let non-takeover targets (firm-years) to appear more than once in the paired sample test data. Using this approach, we are able to obtain a pair for approximately 70 % of the observations in our original takeover target set, resulting to 1380 pairs.

#### **4. RESEARCH DESIGN**

In this section, we present the empirical models used in the examination of the hypothesis. Following Dong et al. (2006) we use two measures of market mispricing: *P/B*

and  $P/V$ .  $P/B$  and  $P/V$  are proxies of the degree of firm undervaluation to the extent that book value of equity ( $B$ ) and our estimate of residual income value ( $V$ ) are proxies for fundamental value. One of the benefits of  $V$  is that it contains forward-looking information. In addition, the underlying residual income valuation model is not affected by accounting choices (Bernard, 1995; Tse et al., 1999).  $V$  has shortcomings as well. First, there is more forward looking information for large firms and for those with large volume of trade in stock exchanges, while little for small and less traded firms. Second, if analyst forecasts are infected with biases that are correlated with market misperceptions, the residual income value may share some of the misvaluation contained in market price (Dong et al., 2006, p. 734). Following Ohlson (1995), we calculate the value at time  $t$  as follows

$$(1) \quad V_t = B(t) + \sum_{s=1}^{\infty} \frac{E_t[(ROE(t+s) - r_e(t))B(t+s-1)]}{[1 + r_e(t)]^s}$$

Equation (1) presents the residual income valuation model where  $V_t$  is the price, and  $B(t)$  is the book value of common equity at the end of period  $t$ ;  $E_t$  is an expectation operator at time  $t$ . Residual income percentage of period  $t$  consists of return on equity ( $ROE$ ) less required rate of equity capital ( $r_e$ ). Residual income of the period  $t$  is the residual income percentage times the beginning of period book value of equity. The idea of the model is that the capital market valuation of equity can be derived from the current book value of equity and the discounted sum of future residual income. The residual income valuation model yields equal market value estimates of equity as does the discounted cash flow model. The equality is proven empirically by Lundholm et al. (2001).

Similarly to Dong et al. (2006) we use the three period forecast horizon. We define CAPM (Lintner, 1965; Mossin, 1966; Sharpe, 1963) required rate on equity capital ( $r_e$ )

using 3.4% premium for equity market, which is US equity market premium from 1985-1998 (Claus and Thomas, 2001, p. 1643), and 10-year risk-free rates (Claus and Thomas, 2001, p. 1641) and enable firm-specific required return on equity capital using firm-specific CAPM-betas.

$$(2) \quad V_t = B(t) + \frac{[f^{ROE}(t+1) - r_e(t)]B(t)}{1 + r_e(t)} + \frac{[f^{ROE}(t+2) - r_e(t)]f^B(t+1)}{[1 + r_e(t)]^2} + \frac{[f^{ROE}(t+3) - r_e(t)]f^B(t+2)}{[1 + r_e(t)]^2 r_e(t)}$$

We compute the forecasted return on equity  $f^{ROE}$  as follows:

$$(3) \quad f^{ROE}(t+s) = \frac{f^{EPS}(t+s)}{\bar{B}(t+s-1)}$$

where  $f^{EPS}(t+s)$  represent the forecasted earnings per share ( $EPS$ ) for period  $t+s$  and  $\bar{B}(t+s-1)$  is defined as an average of the subsequent book values of equity per share as follows:

$$(4) \quad \bar{B}(t+s-1) = \frac{B(t+s-1) + B(t+s-2)}{2}$$

We calculate the forecasted book value of equity per share as

$$(5) \quad f^B(t+s) = f^B(t+s-1) + (1-k)f^{EPS}(t+s)$$

where the dividend payout ratio,  $k$  is assumed constant and determined by

$$(6) \quad k = \frac{D(t)}{EPS(t)}$$

We compute the announcement-period cumulative abnormal returns (*CAR*s) for the three-day period (one day before and one day after) around the announcement day, day 0. For the market return we use Morgan & Stanley, USA return index.<sup>2</sup> Similarly to Fuller et al. (2002) and Dong et al. (2006), we employ the modified market model where  $r_i$  is the firm-*i* return and  $r_m$  is the market return:

$$(7) \quad CAR_i = r_i - r_m$$

To enable empirical testing of the hypothesis that the auditor quality affects the target premia, we estimate an ordinary least squares regression.

$$(8) \quad CAR_i = \alpha_0 + \alpha_1 BIGN_i + \alpha_2 TENDER_i + \alpha_3 CASH_i + \alpha_4 FINANCIAL\_BIDDER_i + \alpha_5 SERVICE_i + \alpha_6 MANUFACTURING_i + \varepsilon_i$$

In regression (8), cumulative abnormal returns ( $CAR_i$ ) are regressed on the BigN dummy ( $BIGN_i$ ), which equals one if target firm is BigN audited and zero otherwise. We include in the regression (8) two acquisition characteristics that prior research suggest impacting target returns around a takeover bid. Because the target share price improvement is usually larger with a tender offer than with merger (Van Horne, 1998, p. 609) we introduce a tender offer dummy ( $TENDER_i$ ), which equals 1 if there is a tender offer and 0 otherwise. Another acquisitions characteristic with an effect to target returns is the payment method. Financing seems to have a significant impact on inferences about overall value creation from mergers. Andrade et al. (2001) provide empirical evidence from 1973 to 1998 suggesting that three-

day abnormal target returns of a stock deal yields to 13% whereas no stock (i.e. cash) to 20%. In other words, cash deals seem to result to higher target returns than stock deals. Bhagat et al. (2005, p. 34) provide parallel empirical evidence on most favorable payment method: the target CAR in cash-only payment method is 31.6% (in the sample of Bhagat et al. 2005, p. 34), followed by mixed payment (28.3% in the sample of Bhagat et al. 2005, p. 34), and stock (12.5% in the sample of Bhagat et al. 2005, p. 34). To control for the effect of payment method, we include a dummy (CASH) which equals 1 in case of cash-only offered as payment method and 0 otherwise. We posit that cash-only payment is positively associated to target CAR.

We add ownership type ( $FINANCIAL\_BIDDER_i$ ) as the third control variable, which is also a dummy variable. By definition, financial bidder is a financial company (buyout firm, venture capital company, merchant bank, commercial bank, and the like), the targets main industry is non-financial, and financial bidder acquires for financial rather than strategic reasons. Financial bidding lacks possibilities for synergies between the companies and hence also for large premiums on target shareholders. If bidder is a financial bidder, variable  $FINANCIAL\_BIDDER_i$  obtains value 1, otherwise 0. Moreover, we add industry dummies and an error term ( $\varepsilon_i$ ). We allow separate levels for firms in manufacturing and service industries of the sample.  $MANUFACTURING_i$  equals 1 for manufacturing companies and is 0 otherwise.  $SERVICE_i$  equals 1 for service companies and is 0 otherwise.

In regression equation (8) the focus is on  $\alpha_1$ , the coefficient of the *BIGN* dummy. If the shareholders of BigN audited firms obtain larger cumulative abnormal returns (*CAR*s) than non-BigN audited firms,  $\alpha_1$  has a positive coefficient.

## 5. EMPIRICAL FINDINGS

### *Descriptive statistics*

Table 2 reports the means, medians, and standard deviations of all variables used in regression equation (8). It shows that the mean *CAR* for three days surrounding takeover bid announcement for the full sample is 0.125. The mean of *BIGN* dummy at 0.882 shows that 88.2% of observations are BigN audited takeover targets and 11.8% non-BigN audited takeover targets. The proportion of tender offers is 3.9% (mean of 0.039) of sample bids. The proportion of cash only payment method is 13.7%, and the proportion of financial bids is 3.7%. 23.5% of the observations come from manufacturing industries, and 19.2% of the observations come from services industries.

Table 2. Descriptive statistics

Variable	n= 2382		
	Mean	Median	Std.Dev.
<i>CAR</i>	0.125	0.109	0.160
<i>BIGN</i>	0.882	1.000	0.320
<i>TENDER</i>	0.039	0.000	0.190
<i>CASH</i>	0.137	0.000	0.340
<i>FINANCIAL BIDDER</i>	0.037	0.000	0.190
<i>SERVICE</i>	0.192	0.000	0.390
<i>MANUFACTURING</i>	0.235	0.000	0.420

Table 2 presents descriptive statistics for the variables used in the multivariate examination of H2. *CAR* is firm *i*'s cumulative abnormal return in a three-day time-window, which centers on the announcement day. *BIGN* is a dummy variable, which equals one for BigN audited takeover targets and zero otherwise. *TENDER* is one in case of tender offer and zero otherwise. *CASH* equals one if payment method was cash only and is zero otherwise. *FINANCIAL BIDDER* equals one if the bidder is financial firm and the target is not and is zero otherwise. *SERVICE* equals one if the firm *i* belongs of SIC industries 70-89 and zero otherwise. *MANUFACTURING* equals one if the firm *i* belongs to SIC industry 20-39 and zero otherwise.



*The pre-bid valuation of BigN and non BigN firms*

The results reported in Panel A of Table 3 on non-BigN audited takeover targets are consistent with the H1 for non-BigN audited takeover targets but not for BigN audited takeover targets. We use pairwise sample t-test to compare the logarithmic means of price-to-book ratio (as well as of price-to-value ratio), separately for BigN and non-BigN audited companies. The logarithmic transformations stabilize the samples in terms of variance and normality. The mean of the paired difference (target - non-target) of price-to-book ratio is slightly positive (0.02) and statistically insignificant (t-statistic 0.54).

Consistent with H1, the mean of the paired difference in the logarithmic price-to-book for non-BigN audited firms is negative, -0.32 (target - non-target) and significant at 1% confidence level (t-statistic -2.55). The paired sample t-test results using P/V are similar. The mean of the paired difference in the logarithmic price-to-value for non-BigN audited firms is negative, -0.38 (target - non-target). However, we are able to obtain only few observations (n=21) for the paired sample t-test using P/V as valuation metric, and the test fails to provide statistically significant results.

*The cumulative abnormal returns of BigN audited and non-BigN audited takeover targets*

Panel B of Table 3 provides univariate results that are consistent with H2. The mean of three-day CAR for non-BigN audited takeover targets (mean 0.146) is higher than that of BigN audited takeover targets (mean 0.122). The difference of the means is 0.024 and it is significant at 5% confidence level.

Table 3. Univariate results

*Panel A. H1 concerning the (pre-bid) valuation of takeover targets compared to non-takeover targets*

Valuation metric	BigN audited			non-BigN audited		
	n	The difference of means	t-statistic	n	The difference of means	t-statistic
Ln Price-to-book (target vs. non-target)	1 271	0.02	0.54	109	-0.32	-2.55 ***
Ln Price-to-value (target vs. non-target)	683	0.05	1.00	21	-0.38	-1.15

*Panel B. H2 concerning the CARs of BigN audited versus non-BigN audited takeover targets*

Auditor type	Cumulative abnormal target returns (n = 2383)		
	Mean	Std.Dev.	t-statistic
BigN audited target	0.122	0.162	
Non-BigN audited target	0.146	0.158	
Difference	0.024		2.34 **

Panel A reports the results of the empirical examination of H1 in which it is posited that takeover targets are misvalued by equity market. For the empirical testing a matched-pair sample has been constructed using size-quartile, two-digit SIC-industry, and year. The paired sample compares the valuation of takeover targets to that of non takeover targets using two valuation metrics: price-to-book and price-to-value. According to the misvaluation hypothesis of the takeover literature, takeover targets should be valued below their intrinsic values, which would appear as a negative difference of means in Panel A. Panel A presents the results of BigN audited and non-BigN audited takeover targets separately. Natural logarithms of the valuation metrics have been used in the pairwise t-tests because of non-normal distribution of both valuation metrics.

Panel B examines H2 concerning the CARs of BigN audited versus non-BigN audited takeover targets in a univariate setting. It reports the difference of means of the cumulative abnormal returns (CAR) in a three day window [-1,1] centered on the announcement day. The rows of Panel B present, first, the CARs of BigN-audited takeover targets, second, the CARs of non-BigN-audited takeover targets, and finally the difference between the two. The t-statistics have been reported as follows: "\*\*\*\*" significant at 1% confidence level, "\*\*\*" significant at 5% confidence level, "\*\*" significant at 10% confidence level.

In Table 4, we examine H2 using ordinary least squares regression (OLS) regression, including variables that prior literature suggests to affect the abnormal earnings related to the target.

Table 4. Regression results

Summary statistics from the regression of cumulative abnormal returns on the auditor quality of the target, tender offer dummy, the payment method of the bid, financial acquisition affiliation of the bidder, and industry dummies.

$$CAR_i = \alpha_0 + \alpha_1 BIGN_i + \alpha_2 TENDER_i + \alpha_3 CASH_i + \alpha_4 FINANCIAL\_BIDDER_i + \alpha_5 SERVICE_i + \alpha_6 MANUFACTURING_i + \varepsilon_i$$

Variable	Pred. sign	Full model		Reduced model	
		Coefficient	t-statistic	Coefficient	t-statistic
<i>INTERCEPT</i>		0.138	14.46 ***	0.112	26.99 ***
<i>BIGN</i>	-	-0.031	-3.08 ***		
<i>TENDER</i>	+	0.030	1.70 **	0.029	1.64 *
<i>CASH</i>	+	0.011	1.01	0.011	1.02
<i>FINANCIAL BIDDER</i>	-	-0.014	-0.93	-0.016	-1.03
<i>SERVICE</i>	?	0.018	1.96 *	0.015	1.61
<i>MANUFACTURING</i>	?	0.039	4.54 ***	0.036	4.19 ***
n		2 382		2 382	
R <sup>2</sup>		0.015		0.011	
Adj.R <sup>2</sup>		0.012		0.009	

*CAR* is cumulative abnormal return from [-1,1] days time window centered on the announcement day. *BIGN* is a dummy variable, which equals one for BigN audited takeover targets and zero otherwise. *TENDER* is one in case of tender offer and zero otherwise. *CASH* equals one if payment method was cash only and is zero otherwise. *FINANCIAL BIDDER* equals one if the bidder is financial but target is not, and is zero otherwise. *SERVICE* equals one if the firm *i* belongs of SIC industries 70-89 and zero otherwise. *MANUF* equals one if the firm *i* belongs to SIC industry 20-39 and zero otherwise. Firms are denoted by *i*. \*\*\**p* < 0.01; \*\**p* < 0.05; \**p* < 0.10; one-tailed if the sign has been predicted, two-tailed otherwise.

Consistent with H2, the slope coefficient of BigN dummy ( $\alpha_1$ ) is negative (coefficient of 0.031) and statistically significant (t-statistic -3.08) suggesting that BigN audited takeover targets obtain 3.1% lower cumulative abnormal earnings compared to non-BigN audited

takeover targets. The tender offer dummy obtains the predicted sign (coefficient 0.030) and is significant at 5% confidence level (t-statistic 1.70).

Payment method dummy ( $CASH_i$ ) and financial bidder dummy ( $FINANCIAL\_BIDDER_i$ ) obtain predicted signs (coefficients 0.011 and -0.014, respectively), however neither yield statistical significance at conventional levels.

#### *Additional tests*

Prior studies on takeover premiums show that many acquisition and target firm characteristics may have an influence on magnitude of takeover premiums. As an additional test, we re-estimated our CAR regression (8) controlling for these additional characteristics to examine the sensitivity of our results. In the following, we briefly discuss these characteristics and how they are measured or proxied in our CAR regression.

*Acquisition characteristics.* A majority ownership allows acquirer to control the decision making of the target and hence often results in higher per share acquisition price. Because of this effect on the pricing, we include a MAJORITY dummy, which equals 1, if the acquirer seeks to obtain over 50% ownership of target shares and 0 otherwise. More than one bidder may increase the deal value (Jarrell and Poulsen, 1989). If multiple bidders participate in the bidding process, the dummy variable MBIDDERS equals 1, and 0 otherwise. There is evidence that overseas acquirers pay higher premiums than US acquirers. To control for that effect on acquisition price we include a dummy variable FOREIGN, which equals 1 in case of an overseas acquisition (i.e. acquirer in a non-US company and target is a US company), and 0 otherwise. We add a FRIENDLY dummy to control for the target management attitude towards the acquisition, and the resulting impacts on the acquisition process. FRIENDLY dummy equals 1 if the attitude is reported as ‘friendly’ in Securities Data

Corporation (SDC) data base, and 0 otherwise. As the last acquisition characteristic, we add a dummy POOLING if the consolidation method of acquirer is pooling accounting and zero otherwise.

*Target firm characteristics.* If target's and acquirer's two-digit SIC codes are equal, we consider target to be close to the acquirer in terms of industry affiliation. To avoid ignoring acquisitions that take place outside of the primary business segment of the acquirer, we compare target firms primary SIC code to the SIC codes (to the primary code and the segment codes) of the acquirer. The resulting CLOSENESS dummy equals 1 if target and acquirer reside in the same two-digit SIC industry. James and Wier (1987), Kohers and Kohers (2000), Jarrell and Poulsen (1989), and Dong et al. (2006, p. 747) find a positive relation between an acquirer's relative size of target to acquirer and target returns. In addition, Moeller et al. (2004) provide evidence on the acquirer-size effect on announcement returns. According to their empirical results, the announcement return for acquiring-firm shareholders is roughly two percentage points higher for small acquirers irrespective of the form of financing and whether the acquired firm is public or private. To control for this effect we add a variable RELSIZE, which is a natural log of (total assets of target / total assets of acquirer).

An acquisition affects the growth opportunities of the combined entity (Kohers and Kohers, 2000). To control for the impact of the growth opportunities on acquisition premium, we add the price-to-book ratio of the target ( $P/B$ ) as a proxy for growth options. According to the empirical results of Dong et al. (2006, p. 747-748) higher target valuation, as indicated by higher  $P/B$ , is associated with lower bid premia. Relying on the findings of Dong et al. (2006, p. 747), we expect that there is a negative relation between the target  $P/B$  and cumulative abnormal returns (CAR). Another target firm characteristic affecting the growth opportunities is the stage of target's growth (Kohers and Kohers, 2000). In the

sensitivity tests, we proxy the stage of target's growth by the natural log of target's total assets.

Because of some (weak) empirical evidence of Officer (2007) that information asymmetry has an impact on the acquisition premia, we examine the sensitivity of our results to information asymmetry. We proxy information asymmetry with the size of the target because analyst coverage (which reduces asymmetry) is driven by the size of the firm.

Following Dong et al 2006 (p. 747), we include a indebtedness measure in the model to control for firms growth opportunities, and because debtness and financial constraints may influence bidder behaviour. Following the suggestion of Hogan (1997) that the decision of some acquisition targets to choose lower quality auditors might arise because of their high risks, we examine the sensitivity of firm-specific risk to our results. We use *GEARING* (debt divided by shareholders equity at the end of last fiscal year before the announcement) as a proxy for growth opportunities and risk.

In addition, target's profitability seems to play a role in the acquisition returns. Namely, using European data, Ismail and Davidson (2007) provide evidence that the profitability of target has a significant positive relation with stock returns. Because of that, we examine the sensitivity of our results to the profitability, which we measure it from the last full fiscal year that ended before the acquisition announcement.

*Time effects.* Moreover, we examine time effects regarding a speculative valuation "bubble", often called as the "dot-com bubble". To examine its potential impact on our results we allow a separate intercept for it.

Our main results remained qualitatively the same after we included these variables into our regression model. As most of these variables were statistically insignificant, and had significant amount of missing values leading to the reduced sample size, we report only the more parsimonious CAR regression (8) in Table 4.

## 6. CONCLUSIONS

The aim of our empirical investigation is to be able to make inferences whether auditor quality makes a difference in a market value of the firm in a systematic way. To this end, we examined the role of audit quality on the formation of target premiums in a business takeover. More specifically, we examined whether there are valuation differences between BigN audited takeover targets and non-BigN audited takeover targets.

Prior literature supports the view that a privately held firm going public can decrease the level of uncertainty of future prospects, and consequently the level of underpricing of her shares, through auditor choice (e.g. Beatty, 1989). It may well be that the impact that auditor choice has on firm value is not limited to the event when a firm goes public (Teoh and Wong, 1993). We believe that if systematic differences in auditee firm values continue to exist subsequent to IPO, business takeovers provide a good setting to observe those differences, if any.

Consistent with the previous studies showing that BigN audited firms going public experience less underpricing compared to other IPO-firms, our findings suggest that those BigN client firms that become takeover targets, are less underpriced than their non-BigN counterparts. Using the sample of over 1300 US takeover offers and their matched pairs from 1990 to 2005, we find that non-BigN targets are undervalued compared to non-target non-BigN client firms whereas we find no evidence suggesting that BigN targets are undervalued prior the takeover announcement. More importantly, our univariate and multivariate tests show that non-BigN targets provide larger cumulative abnormal returns than BigN targets, indicating a stronger market reaction to non-BigN takeover announcements.

---

<sup>12</sup> According to Chakrabarti et al. (2005, p. 1242) Morgan Stanley is a leading provider of global indices and related services to investors worldwide with the most widely used benchmarks for non-US stock markets since 1969. Of all the Morgan Stanley indices regional and country indices are the most popular.

## References

- Andrade, G., Mitchell, M. and Stafford, E.** (2001) New Evidence and Perspectives on Mergers, *Journal of Economic Perspectives*, 15(2), 103-120.
- Balvers, R.J., McDonald, B. and Miller, R.E.** (1988) Underpricing of New Issues and the Choice of Auditor as a Signal of Investment Banker Reputation, *Accounting Review*, 63(4), 605-622.
- Beatty, R.P.** (1989) Auditor Reputation and the Pricing of Initial Public Offerings, *Accounting Review*, 64(4), 693-709.
- Belsley, D. A., Kuh, E., Welsch, R.E.** (1980) *Regression diagnostics: Identifying Influential Observations and Sources of Collinearity*, New York: John Wiley.
- Berger, P.G. and Ofek, E.** (1996) Bustup Takeovers of Value-Destroying Diversified Firms, *Journal of Finance*, 51(4), 1175-1200.
- Bernard, V.L.** (1995) The Feltham-Ohlson framework: Implications for empiricists, *Contemporary Accounting Research*, 11(2), 733-747.
- Bhagat, S., Ming Dong, Hirshleifer, D. and Noah, R.** (2005) Do tender offers create value? New methods and evidence, *Journal of Financial Economics*, 76(1), 3-60.
- Bradley, M., Desai, A. and E. Han Kim, A.** (1988) Synergistic Gains from Corporate Acquisitions and their Division between the Stockholders of Target and Acquiring Firms, *Journal of Financial Economics*, 21(1), 3-40.
- Chakrabarti, R., Huang, W., Jayaraman, N. and Lee, J.** (2005) Price and volume effects of changes in MSCI indices -- nature and causes, *Journal of Banking & Finance*, 29(5), 1237-1264.
- Christofferson, S.A., McNish, R.S. and Sias, D.L.** (2004) Where mergers go wrong, *McKinsey Quarterly*, (2), 92-99.
- Claus, J. and Thomas, J.** (2001) Equity premia as low as three percent? Evidence from analysts' earnings forecasts for domestic and international stock markets, *The Journal of Finance*, 56(5), 1629-1666.
- DeAngelo, L. E.** (1981) Auditor size and audit quality, *Journal of Accounting and Economics*, 3, 183-199.
- DeFond, M. L.** (1992) The Association Between Changes in Client Firm Agency Costs and Auditor Switching, *Auditing: A Journal of Practice and Theory*, 11(1), 16-31.
- Dong, M., Hirshleifer, D., Richardson, S. and Teoh, S.H.** (2006) Does Investor Misvaluation Drive the Takeover Market? *The Journal of Finance*, 61(2), 725-762.
- Francis, J. R. and Wilson, E. R.** (1988) Auditor changes: A joint test of theories relating to agency costs and auditor differentiation, *The Accounting Review* (October), 663-682.



- Firth, M. and Smith, A.** (1992) Selection of auditor firms by companies in the new issue market, *Applied Economics*, 24(2), 247.
- Fuller, K., Netter, J. and Stegemoller, M.** (2002) What Do Returns to Acquiring Firms Tell Us? Evidence from Firms That Make Many Acquisitions, *Journal of Finance*, 57(4), 1763-1793.
- Garner, J.L. and Marshall, B.B.** (2005) Unit IPOs: What the Warrant Characteristics Reveal about the Issuing Firm, *Journal of Business*, 78(5), 1837-1858.
- Grossman, S.J. and Hart, O.D.** (1980) Takeover bids, the free-rider problem, and the theory of the corporation, *Bell Journal of Economics*, 11(1), 42-64.
- Hogan, C.E.** (1997) Costs and benefits of audit quality in the IPO market: A self-selection analysis, *Accounting Review*, 72(1), 67.
- Ismail, A. and Davidson, I.** (2007) The Determinants of Target Returns in European Bank Mergers, *Service Industries Journal*, 27(5), 617-634.
- James, C.M. and Wier, P.** (1987) Returns to Acquirers and Competition in the Acquisition Market: The Case of Banking, *Journal of Political Economy*, 95(2), 355.
- Jarrell, G.A. and Poulsen, A.B.** (1989) The Returns to Acquiring Firms in Tender Offers: Evidence from Three Decades, *FM: The Journal of the Financial Management Association*, 18(3), 12-19.
- Jensen, M.C.** (1986) Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *American Economic Review*, 76(2), 323-329.
- Johnson, W. B. and Lys, T.** (1990) The Market for Audit Services: Evidence from Voluntary Auditor Changes, *Journal of Accounting and Economics* 12, 281-308.
- Kohers, N. and Kohers, T.** (2000) The Value Creation Potential of High-Tech Mergers, *Financial Analysts Journal*, 56(3), 40.
- Krishnan, J. and Schauer, P. C.** (2000) The Differentiation of Quality among Auditors: Evidence from the Not-for-Profit Sector, *Auditing: A Journal of Practice and Theory*, 19(2), 9-25.
- Lennox, C.** (1999) Are large auditors more accurate than small auditors?, *Accounting and Business Research*, 29(3), 217-227.
- Lintner, J.** (1965) The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets, *The Review of Economics and Statistics*, 47(1), 13-37.
- Lundholm, R., O'Keefe, T. and Feltham, G.A.** (2001) Reconciling Value Estimates from the Discounted Cash Flow Model and the Residual Income Model, *Contemporary Accounting Research*, 18(2), 311-335.
- Moeller, S.B., Schlingemann, F.P. and Stulz, R.M.** (2004) Firm size and the gains from acquisitions, *Journal of Financial Economics*, 73(2), 201-228.
- Moizer, P.** (1997) Auditor Reputation: the International Empirical Evidence, *International Journal of Auditing* 1(1), 61-74.
- Mossin, J.** (1966) Equilibrium in a Capital Asset Market, *Econometrica*, 34(4), 768-783.

- Officer, M.S. (2007)** The price of corporate liquidity: Acquisition discounts for unlisted targets, *Journal of Financial Economics*, 83(3), 571-598.
- Ohlson, J.A. (1995)** Earnings, book values, and dividends in equity valuation, *Contemporary Accounting Research*, 11(2), 661-687.
- Palmrose, Z.-V. (1988)** An Analysis of Auditor Litigation and Audit Service Quality, *The Accounting Review*, 63(1), 55-73.
- Petroni, K. and Beasley, M. (1996)** Errors in Accounting Estimates and Their Relation to Audit Firm Type, *Journal of Accounting Research*, 34(1) (Spring), 151-171.
- Roll, R. (1986)** The Hubris Hypothesis of Corporate Takeovers, *The Journal of Business (1986-1998)*, 59(2), 197-216.
- Sharpe, W.F. (1963)** A Simplified Model for Portfolio Analysis, *Management Science (Pre-1986)*, 9(2), 277-293.
- Shleifer, A. and Vishny, R.W. (2003)** Stock market driven acquisitions, *Journal of Financial Economics*, 70(3), 295-311.
- Taylor, M. H. & Simon, D. T. (1999)** Determinants of Audit Fees: The Importance of Litigation, Disclosure, and Regulatory Burdens in Audit Engagements in 20 Countries, *The International Journal of Accounting*, 34(3), 375-388.
- Teoh, S. H. and Wong, J. J. (1993)** Perceived Auditor Quality and the Earnings Response Coefficient, *The Accounting Review*, 34 (April), 346-66.
- Titman, S. and Trueman, B. (1986)** Information quality and the valuation of new issues, *Journal of Accounting and Economics*, 8(2), 159-172.
- Tse, S.Y., Yaansah, R.A. and Ohlson, J.A. (1999)** An analysis of historical and future-oriented information in accounting-based security valuation models / Discussion, *Contemporary Accounting Research*, 16(2), 347-384.
- Walker, K. B. and Johnson, E. N. (1996)** A Review and Synthesis of Research on Supplier Concentration, Quality and Fee Structure in Non-U.S. Markets for Auditor Services, *The International Journal of Accounting*, 31(1), 1-18.
- Van Horne, J.C. (1998)** *Financial management and policy*, Upper Saddle River, N.J. ; London: Prentice-Hall International.
- Yardley, J. A., Kauffman, N. L., Cairney, T. D. & Albrecht, W.D. (1992)** Supplier Behavior in the U.S. Audit Market, *Journal of Accounting Literature*, 11, 151-184.