



University of
Salford
MANCHESTER

Managerial overconfidence and M&A performance : evidence from China

Guo, JM, He, Q, Xin, J and Liu, JL

<http://dx.doi.org/10.1504/IJBAAF.2020.10028269>

Title	Managerial overconfidence and M&A performance : evidence from China
Authors	Guo, JM, He, Q, Xin, J and Liu, JL
Type	Article
URL	This version is available at: http://usir.salford.ac.uk/id/eprint/48964/
Published Date	2020

USIR is a digital collection of the research output of the University of Salford. Where copyright permits, full text material held in the repository is made freely available online and can be read, downloaded and copied for non-commercial private study or research purposes. Please check the manuscript for any further copyright restrictions.

For more information, including our policy and submission procedure, please contact the Repository Team at: usir@salford.ac.uk.

Managerial overconfidence and M&A performance: Evidence from China

Jie Michael Guo^a, Qian He^a, Jiayuan Xin^b, and Jia Liu^c

^a*Durham University, Durham University Business School, Mill Hill Lane, Durham, DH1 3LB, UK, Email: jie.guo@durham.ac.uk; qian.he@dur.ac.uk*

^b*Newcastle University, Newcastle University Business School, 5 Barrack Rd, Newcastle upon Tyne NE1 4SE, UK, Email: jiayuan.xin@ncl.ac.uk*

^c*University of Salford, Salford Business School, Salford, M5 4WT, UK, Email: j.liu@salford.ac.uk*

Corresponding Author: Jie Michael Guo

Abstract

We examine the extent to which managerial overconfidence creates value to acquirers in successful M&As undertaken by Chinese listed firms in the period of 2006–2012. The empirical results show that Chinese acquirers gain value in both the short run and the long run after the M&A announcement. Our study provides new evidence that the market responds favorably to M&A deals undertaken by acquirers with more managerial overconfidence in both the short run and the long run. Our multivariate analyses, however, show that managerial overconfidence has a minimal role in explaining the stock price movement. In addition, we find that firm size is an important determinant for the relationship between overconfidence and market reaction to merger deals. Taken together, we conclude that managerial overconfidence has little effect in driving merger and acquisition deals in China.

Keywords: mergers and acquisitions; market performance; managerial overconfidence; Chinese Market

1. Introduction

Mergers and acquisitions (M&As) have been experiencing an unprecedented growth in the last two decades, becoming an important socio-economic phenomenon and a dominant growth strategy for many corporations around the world (Houston & Ryngaert, 1994; Harford, 2005). A review of the M&A trend worldwide shows that the number of deals has increased by 59.9%, and their value has increased by 176.5% over the period of 1995 and 2010 (DePamphilis, 2012). The motives that drive M&As have been subject to intensive examination. Many studies go on to explore its impact on the wealth of parties involved. Many of these studies demonstrate that bidding firms' shareholders, on average, earn negligible returns, while others make small losses and at best break even surrounding the announcement date (King, Dalton, Daily, & Covin, 2004; Masulis, Wang, & Xie, 2007; Sudarsanam & Mahate, 2003, 2006). Findings from long-run studies are also inconclusive but suggest negative stock performance in general (Dutta & Jog, 2009; Lyon, Barber, & Tsai, 1999).

Several major theories have been put forward to explain this phenomenon, including efficiency theory, monopoly theory, raider theory, valuation theory, and hubris theory. Efficiency theory argues that M&As are expected to produce synergies with a lower cost of capital, better management, and operating synergies. Valuation theory, *i.e.* the private information hypothesis, proposes that acquirers are better informed than the target, and instead of sharing information with the target, they choose to buy the target to benefit their own shareholders. The majority of previous studies emphasize the foundation of rational investors. With the development of behaviour finance, researchers add psychology, with particular reference to managerial characteristics, to the corporate behaviour framework. In particular, the hubris hypothesis theory proposes that Managers tend to be overoptimistic about their ability and overvalue M&A gains and synergies (Roll, 1986). This leads to aggressive acquisition and overpayment, damaging shareholders' value.

Many studies have identified managerial overconfidence in different markets. Hayward & Hambrick (1997) find overconfidence amongst U.S. bidders. They find that the premiums paid in acquisitions are highly associated with bidders' CEO overconfidence. Malmendier & Tate (2008)

find supportive evidence that the market reaction at the M&A announcement for overconfident CEOs (-90 basis points) is significantly more negative than for non-overconfident CEOs (-12 basis points). Further Raj & Forsyth (2003) find that overconfident CEOs tend to make value-losing bids among the UK's bidders. Yates *et al.* (1997) conduct a cross-country study on Taiwan, Japan and Australia, and compare the role of over-confidence with that of the U.S. They find that overconfidence among Asian managers is typically higher than among their western counterparts. Japanese managers, however, demonstrate less overconfidence compared to their peers in other countries. On the contrary, Lin *et al.* (2008) find managerial overconfidence among Japanese acquirers.

Evidence on China's mergers and acquisitions is limited. Zhang (2003) studies Chinese M&A activities from 1993 to 2002 and finds that acquiring firms lose value and that the net influence on the acquirer and target together is not significant. Shi and Zhu (2010) find that managerial overconfidence helps drive M&A activities from 2006 to 2008. They find that there is a significant positive correlation between managerial overconfidence and MA activity. Jiang *et al.* (2011) identify an insignificant relationship between overconfidence and the undertaking of M&A activities for the period of 2002 – 2005. However, none of these studies, to the best of our knowledge, has examined the extent to which market performance (stock price movement) is influenced by managerial overconfidence in the course of M&A activities in China's market.

In this study, we examine the bidding firm's short- and long-run performance following the announcement, and put emphasis on the role of managerial overconfidence in how the market responds and performs in the case of successful M&A deals for the period 2006–2012. To this end, we compare and contrast its impact on the short-run and long-run performance of acquirers with two levels of managerial overconfidence, and in the meantime control for a range of time-dependent variables which incorporate a range of categories of acquirers and targets on short-run and long-run market performance. Our study shows that acquirers gain value in both short- and long-runs after M&A deals. Our further results show that acquirers with a lower overconfidence level underperform compared to the entire sample of the firms in the short run, while acquirers with

a high overconfidence level outperform in the short-run. However, in the long-run, acquirers with a lower overconfidence level underperform compared to those with a higher overconfidence level. Our multivariate analyses show that managerial overconfidence has little influence on the acquirer's short- and long-run performance. Our further analysis on the basis of sub-groups by firm size provides supportive evidence that managerial overconfidence has no significant effect on the acquirer's short-run performance, although managerial overconfidence has a positive impact on the acquirer's long-run performance. We conclude that managerial overconfidence has an insignificant role in influencing market performance in the case of China's M&A deals.

Our study contributes to the literature in two fields. It examines the hubris hypothesis in the context of China's M&As, and provides evidence to suggest that the hubris hypothesis has limited application to China's market, which has an imperfect legal system and ineffective supervision mechanism (Jiang *et al.*, 2011), as well as a large proportion of state ownership (Zhou *et al.*, 2012). To the best of our knowledge, this is the first study on the role of managerial overconfidence in value creation to acquirers in China. Second, our study provides fresh evidence that managerial overconfidence leads to an increase in acquirers' market performance in the short- and long-runs. Our study has practical implications for policy-makers and corporate and international investors who are contemplating Chinese M&As. In particular, our findings provide an indication to investors with respect to market efficiency, and potential implications for value creation from the managerial perspective, when they evaluate merger deals (Hartman, 1996), and provides a guided suggestion that CEOs should remain his overconfident decisions as in Aktas *et al.* (2005).

The rest of this paper proceeds as follows: Section 2 briefly reviews the literature and discusses the main hypotheses. Section 3 discusses methodological issues. Section 4 presents and discusses the empirical results. Section 5 summarises our arguments.

2. Literature review and hypothesis development

Overconfidence refers to the physiological phenomenon that people tend to overestimate the probability of upcoming events, and is one of the most robust discoveries in the psychology of

decision-making (Debondt and Thaler, 1994; Barberis and Thaler, 2003). Many studies find overconfidence amongst entrepreneurs and managers. Cooper, Dunkelberg and Woo (1988) prove that overconfidence exists widely among entrepreneurs in America, and show that American entrepreneurs believe the probability of the success of their company is 22% higher compared to their peers. Landier *et al.* (2004) find a consonant conclusion for French entrepreneurs. Further, some note that overconfident managers tend to make more investments (Malmendier and Tate, 2005), while under-estimating the capital cost of their investments by 50 percent compared to their peers (Merrow *et al.*, 1981).

Roll (1986) proposes three testable hypotheses with the existence of hubris in M&A activities: a) the value of the bidding firm should fall after the M&A; b) the post-merger value of the target firm should increase; and c) the total value of the target and bidder firms as a whole should fall slightly. These influential hypotheses have engendered two main streams of empirical studies on the role of managerial overconfidence associated with M&A activities.

One of the biggest challenges in studying hubris theory is measuring CEO's overconfidence because there is no direct way to measure human physiological bias. Researchers have developed different variables as proxies for managerial overconfidence. Malmendier and Tate (2005) develop three dummy variables with CEO's portfolio holdings in proxy for overconfidence relating to the managerial decision to cash in stock options.

Hayward and Hambrick (1997) suggest that sources of CEO overconfidence may be embodied in recent organizational success, media praise for the CEO and the CEO's self-importance. They develop three measures in proxy for CEO overconfidence: recent acquirer performance, media praise for the CEO, and relative compensation. Lin *et al.* (2005) design a proxy on the basis of the bias of the CEO's forecast of its own firm's profit.

According to Hayward and Hambrick (1997), self-importance is an important source of hubris because managers' fluctuating views of their abilities may originate from an inherent trait towards self-importance. Hayward and Hambrick (1997) construct a fourth proxy by combining the three

proxies. “Self-importance may be an aggregate construct, intersecting with or even composed of other personality traits such as self-esteem narcissism and the need for power” (Hyward and Hambrick, 1997). According to Frank (1985), the CEO’s salary relative to other officers in the same firm reveals CEO’s self-importance. According to Tosi and Gomez-Mejia (1989), CEOs have considerable influence upon the setting of their own salary and great control upon other managers' salaries. Therefore, the CEO’s salary relative to other managers in the same company reveals a CEO’s self-importance (Frank, 1985). Hambrick and D'Aveni (1992) give an example of the use of this indicator. They find that a proxy for the CEO's dominance (the CEO's salary divided by the average salary for other managers) was significantly higher for bankrupt companies than for a matched group of survivor companies five years before they failed.

Recent studies focus on the effect of managerial overconfidence on acquirers' value. Malmendier and Tate (2008) show that overconfident CEOs have a 65% greater propensity to make an acquisition. They find that the market reacts more negatively to a M&As announcement for overconfident CEOs (–90 basis points) than for non-overconfident CEOs (–12 basis points). Hyward and Hambrick (1997) find that the premiums paid for acquisitions are highly associated with the four indicators of bidders' CEO overconfidence. They also find that shareholders whose company has greater CEO overconfidence lose more value following an acquisition. Using two proxies for CEO overconfidence high acquisitiveness and inside dealings Doukas and Petmezas (2007) find that overconfident acquirers suffer lower announcement returns and present worse long-run post merger performance than rational acquirers. Brown and Sarma (2007) use media coverage to construct the proxy for CEO overconfidence among Australian acquisitions, and show that CEO overconfidence has a significant effect on the acquisition decision. Raj and Forsyth (2003) use bid premiums and valuation ratios as the measures to identify overconfident acquirers among successful M&As in the UK during the 1990s, and show that overconfident acquirers lose value significantly during the announcement period. Lin *et al.* (2008) study Japanese M&As using past stock performance as the proxy for overconfidence. Their result show that high overconfident bidders experience negative abnormal returns, while the opposite holds for low overconfident

bidders during the event period.

Researches on China's market have recognized the role of managerial overconfidence. Wright and Phillips (1980) show that Asians are more likely to assess extreme and unrealistic numerical probabilities compared to British people, suggesting a higher level of overconfidence in Asian countries. Yates *et al.* (1989) find that cultural differences of overconfidence can be seen in the process of decision-making and that Chinese culture reveals a higher overconfidence level among Chinese than Japanese and Americans. Wang *et al.* (2008) examine the investment decision of Chinese listed firms and find that overconfident managers tend to over-invest.

Fu and Fang (2008) apply a prosperity index to measure overconfidence and find that managerial overconfidence drives acquisitions. Jiang *et al.* (2009) use two proxies for overconfidence – conflict times of earning forecast and relative salary of top 3 managers – to study Chinese listed companies from 2003 to 2006, and find an insignificant negative relationship between managerial overconfidence and the acquirer's tendency to undertake M&A activity. Their result is at odds with the conclusions of many previous studies on other markets.

Jiang *et al.* (2011) argue that Chinese managers are more overconfident than managers in other countries because of the traditional culture, imperfect legal system and ineffective supervision mechanism in China. The deeply rooted Confucianism in Chinese traditional culture, which honours the culture of hierarchy to an extreme degree, gives the CEO dominating power over the company. The fact that quite a lot of CEOs are also presidents of their companies strengthens this domination (Jiang *et al.*, 2011). Further, China lacks a necessary supervision mechanism which can effectively offset CEO's dominating power, causing managerial overconfidence.

To date, there are not any managerial stock options in China's stock market. We use manager's relative salary ratio as the proxy for managerial overconfidence – manager's relative salary ratio equals the highest salary of all top managers of bidding firms divided by the average salary of all top managers of the same firm. A higher relative salary ratio in the year of a deal announcement reflects a higher managerial overconfidence level (REFs). In line with Roll (1986) that the value

of an overconfident bidder falls after the merger, we state our hypothesis as follows:

H₁: Managerial overconfidence has a negative effect on a Chinese acquirer's short-run and long-run market performance.

In what follows, we apply quantitative methodologies adopted by previous studies for the Chinese M&A market and test this hypothesis.

3. Methodological issues

3.1. Data and sample selection

We examine successful M&A transactions in China's stock market in the period 2006–2012. The acquiring firm must be a Chinese firm listed either on the Shanghai Stock Exchange or on the Shenzhen Stock Exchange, while there is no restriction on the targets. The China Stock Market and Accounting Research (CSMAR) provide data for managers' salary from 1999. However, a large volume of data on salary is missing from 1999 to 2005. To ensure the data quality, we set the sample period from 2006 to 2012 when we carried out this study. The initial selection generates 1,953 M&A deals. Data of M&A details, including acquirer name, target name, deal value, relative size and date, Price Index, accounting ratios, and firms' Datastream code, are obtained from Thomson One Banker. We then match the code in Datastream and download stock price (P_t), and calculate stock returns ($R_t = \ln \frac{P_t}{P_{t-1}}$) from Datastream database. Samples with missing data and negative M/B ratios are deleted.

To observe closely managerial overconfidence, we classify firms according to their levels of managerial overconfidence and firm size. First of all, we classify firms based on the median value of managerial overconfidence¹. Firms above the median value are classified as firms with a higher level of overconfidence, while those below the median value as firms with a lower level of

¹All results are consistent if using mean value instead.

overconfidence. Second, firms are grouped on the basis of firm size into small-sized acquirers and large-sized acquirers. Firms above the median value of total assets of the whole sample are classified as small-sized acquirers, while those below the median value as large-sized acquirers.

Table 1 shows the descriptive statistics of deal numbers and value of transactions for the whole sample. The number of successful deals per year increases from 63 in 2005 to 492 in 2012 and the total value of transactions increases from \$9,013 million in 1999 to \$40,649 million in 2012. The number of effective/unconditional deals keeps growing at a high speed during the seven year period, especially in 2006 and 2007. The total value reaches its highest value in 2011 and falls slightly in 2012. Generally speaking, the M&A activities undertaken by Chinese listed firms have experienced an unprecedented growth in the past seven years.

Insert Table 1 here.

Table 2 reports descriptive statistics of managers' relative salary. The mean and standard deviation of managers' relative salary remains relatively stable from 2006 to 2012.

Insert Table 2 here.

3.2. Measuring abnormal returns

We adopt a modified market model to compute the short-run abnormal returns to acquirer (Brown and Warn, 1985). We use the value-weighted return of the Shanghai and Shenzhen Stock Exchange as the market return for the companies listed on the respective stock exchanges. We calculate abnormal returns within 3 days around the deal announcement date using²

$$CAR_{it} = \sum_{t-1}^{t+1} (R_{i,t} - R_{M,t}) \quad (1)$$

where $R_{i,t}$ is the bidding firm i 's return on day t and $R_{M,t}$ is the value-weighted return of the Shanghai or Shenzhen Stock Exchange on day t . The results are robust to equally weighted stock returns.

To evaluate long-run post-merger market performance, we adopt buy-and-hold abnormal returns

²We also use a 5-day (-2, +2) event window CAR on the M&A announcement date tests and find the results to remain consistent with our main findings.

(BHARs) (Lyon *et al.*, 1999). We construct a reference portfolio instead of using a market portfolio as a benchmark to calculate abnormal returns. We construct the reference portfolio with size and M/B ratio on the basis of Fama and French's (1993) three factor model. For a given month t , size is the average of monthly reported market value, and M/B ratio is an average of monthly reported market-to-book ratio. To construct the reference portfolio in month t , we first divide the bidding firms into five groups according to firm size. Each group is then divided into ten subgroups according to M/B ratio. We then calculate the average monthly return of each subgroup in month t . Monthly returns are calculated with Total Return Index (RI) available from Datastream. The RI represents a theoretical value growth of a stock holding over a specified period, assuming that all dividends are re-invested to purchase additional stocks at the price on the ex-dividend day. The BHAR of a given acquirer is calculated over 24 months after the announcement date as below³:

$$BHAR_i = \prod_{t=0}^T(1 + R_{i,t}) - \prod_{t=0}^T(1 + E(R_{i,t})) \quad (2)$$

where $R_{i,t}$ is the real return of acquirer i in month t ; $E(R_{i,t})$ is the expected return calculated with the reference portfolio; T is the length of studying period, which is 24 months.

3.3. Multivariate regressions on CARs and BHARs

To investigate the influence of managerial overconfidence on acquirers' short-run and long-run performance, we adopt multivariate ordinary least square (OLS) regressions. The dependent variable is the 3-day CAR for the acquirer's short-term market performance or BHAR for the acquirer's long-term market performance. The independent variables are managerial overconfidence proxy and other controlling variables that may influence the acquirers' performance. The regression models are shown as below:

$$CARs \text{ or } BHARs = c + \alpha_1 \text{Relativesalary} + \alpha_2 \text{Cash} + \alpha_3 \text{Stock} + \alpha_4 \text{Diversify} + \alpha_5 \text{Logrelativesize} + \alpha_6 \text{Logtotalasset} + \alpha_7 \text{Leverage} + \frac{\alpha_8 M}{B} + \alpha_9 \text{Bgov} + \alpha_{10} \text{Sgov} +$$

³We also calculated 12-month and 36-month BHARs for our sample and find the results to remain consistent with our main findings.

$$\sum \beta_i Year + \sum \gamma_j Industry + \epsilon_6 \quad (3)$$

where Relative salary measures managerial overconfidence, and is equal to maximum salary of all top managers divided by the average salary of all top managers from a bidding firm. We include a set of control variables. According to Loughran and Vijh (1997), the method of payment can be related to merger performance. They find that firms that complete mergers with stock earn significantly less than firms that complete tender offers with cash. One possible explanation could be that firms tend to pay in stock when their stocks are overvalued, whereas firms tend to pay in cash when their stocks are undervalued. To control the payment effect, we generate two dummy variables: 100 cash payment and 100 stock payment. Cash is equal to one if the deal is paid with 100% cash, and zero otherwise. Stock equals one if the payment method is 100% stock, and zero otherwise. To capture the cross-industry effect, we include firm diversity, *Diversify*. *Diversify* is a dummy variable, which equals one if the acquirer's first two-digit Standard Industry Classification (SIC) code is different from that of the target. We measure firm size, *Log total asset*, by the logarithm of the acquirer's total assets one accounting year before the announcement date. Leverage is the ratio, which equals the long-term debt divided by total assets of the acquiring firm one accounting year before the announcement date.

Moeller *et al.* (2004) find that small acquirers earn significantly higher announcement returns than average, suggesting the existence of a size factor in acquisition returns. Asquith, Bruner and Mullins (1983) find that the relative size of the target to the acquirer has a significant influence on the returns of the acquiring firm surrounding a merger. To control this relative size effect, we add *Log relative size*, which is equal to the logarithm of the value of transactions divided by the acquiring firm's total assets in the last fiscal year before the announcement. In the model, Leverage is the ratio that equals long-term debt divided by the total assets of the acquiring firm one accounting year before the announcement date. We also add market-to-book ratio of the acquiring firm, *M/B*, as measured by the total market value of equity over total assets of the acquiring firm one year before the announcement date.

State ownership of the acquirer or the target may influence the short-run and long-run

performance of the Chinese acquiring firms (Zhou *et al.*, 2012). We introduced two dummy variables in the regressions. Bgov equals one if the government gets involved on the buyer side—the acquirer, investor is government or the acquirer, the investor is directly or ultimately owned by the government, in the M&A deal; otherwise zero. Sgov equals one if the government gets involved on the seller’s side—the seller is government or the target, seller is directly or ultimately owned by the government in the M&A deal. Otherwise, Sgov equals to zero. We also include year dummies and industry dummies to control for year effects and industry effects, respectively.

Table 3 reports basic statistics of the key variables in the estimations. The mean values of Cash and Stock suggest that 26% and 11% of all deals are paid with cash and stock respectively. In our sample, nearly half of all mergers are cross-industry deals. For all the deals, the size of the targets is smaller than that of the acquirer. As shown in Table 3, the average debt level of acquirers is quite low, suggesting that acquirers in China have sufficient debt capacity before merger deals. Roughly 12% of the acquirers and 26% of the targets have a relationship with the government.

Insert Table 3 here.

4. Empirical results

4.1. Managerial overconfidence and the acquirer’s short-run market performance

Table 4 reports the CARs of acquirers in different groups over the 3-day window of the deal announcement. It appears that the announcement effect for the whole sample is significantly positive⁴. This is inconsistent with Moeller *et al.* (2004) that bidding firms lose value on average at announcement. Our further results show that the average return of the firms with lower managerial overconfidence (0.67%, $p < 0.01$) is lower than the average of the whole sample, while the opposite holds for firms with higher managerial overconfidence (0.78%, $p < 0.01$).

Insert Table 4 here.

⁴ All parametric t-tests are skewness corrected following Hall (1992).

In summary, our univariate test of CARs shows that the whole sample displays positive abnormal returns around the deal announcement. This suggests that the Chinese market responds favourably to the M&A announcement. Our result is at odds with those of earlier researches that acquirers lose value on average at announcement.

Coming to the sub-group analysis by managerial overconfidence, we find that firms with lower overconfidence report a lower average 3-day CAR than the whole sample, while the opposite holds for firms with higher overconfidence. Firms with higher overconfidence present higher average CARs than those with lower overconfidence, suggesting that the Chinese market responds more positively to M&A deals undertaken by acquirers with high managerial overconfidence. Overall, our results show that managerial overconfidence creates value to acquirers in the short run.

4.2. Managerial overconfidence and the acquirer's long-term market performance

The results of long-run market performance are reported in Table 5. It appears that acquirers' average 24-month BHAR of the whole sample is significantly positive at the 1% level, suggesting that markets perceive that M&As create value to the acquirers in the long run.

Further, our results on the basis of managerial overconfidence level show that firms with a lower overconfidence level have a significantly positive average BHAR (9.24%) at the 1% level, but their average BHAR is lower than that of the whole sample (16.87%). Firms with a higher overconfidence level demonstrate a higher average BHAR compared to the whole sample. Our long-term performance analysis suggests that M&As enhance firm value in the long run, and managerial confidence facilitates value creation to the acquirers. The evidence of univariate analysis does not support our hypothesis that the market devalues acquirers with overconfident managers.

In summary, the evidence of our univariate analysis does not support the hypothesis that the market devalues acquirers with overconfident managers in both the short- and long-run.

Insert Table 5 here.

4.3. Multivariate regression

The results of multivariate regression on CARs are reported in Table 6. Most notably, managerial overconfidence generates a positive impact on market performance, which is consistent with the possibility that the market attributes better valuation to acquirers with higher overconfidence. However, this result is not statistically significant. In addition, the coefficient of stock payment is significantly positive at 1.05, indicating that the Chinese market responds favourably to M&A deals with 100% stock payment in the short run. More precisely, stock payment leads to 1.05% increase in stock return. This is consistent with our hypothesis that the market prefers M&A deals with 100% stock payment. Diversify has little impact on the 3-day CARs. This may be an indication that cross-industry acquisitions do not bring in complementary value to the resultant firm as proposed by the coinsurance hypothesis (Seth, 1990). The size of the targets, *Log relative size*, has a highly significant positive influence on the 3-day CARs at the 1% level, suggesting that a 1% increase in firm size generates 0.47% higher stock returns. This indicates that acquiring larger targets is more beneficial to acquirers in China's market. We suggest two reasons. The cost of purchase is not a big concern for acquirers; and large targets would bring in value which may complement their businesses through diversification. Sell side government involvement shows a highly significant, positive effect on CARs. This indicates that the Chinese market believes that buying a target which is owned by the government (or has a heavy government involvement) may enhance value for acquirers. This could be for political reasons (Biais and Perotti, 2002), or due to the Chinese legal system (Bortolotti *et al.*, 2002). When it is the largest stakeholder of a partially privatised firm, the government sends the market an implicit signal that it will not expropriate other shareholders' wealth (Zhou *et al.*, 2012). Financial leverage generates a positive effect on CARs at the 10% level. This may suggest that acquirers with a higher debt level would promise better performance due to the binding power inherent in disciplinary contracts, at least in the short run.

Insert Table 6 here.

The results of multivariate regression on the 24-month BHARs are reported in Column B in Table 6. Most notably, managerial overconfidence has little influence on the acquirer's long-run market performance. Our results do not support Yates *et al.* (1997, 1998), who suggest that overconfidence in China is robust and the Chinese tend to be more overconfident than people in other countries such as America. Moreover, the coefficients on both cash and stock payments are statistically insignificant, indicating that the payment method does not affect market performance in the long run. Acquiring a target from a different industry does not show any significant influence on the long-run performance. Firm size has a significant positive influence on BHARs at the 1% level, which is consistent with our result for short-run market performance. These results suggest that the Chinese market favours M&As with large targets in both the short run and the long run. This is consistent with previous literature (Moeller *et al.*, 2004). Financial leverage, however, shows a significant negative effect on BHARs at the 5% level, which is contrary to our results for short-run market performance. This suggests that Chinese acquirers with higher debt levels gain less value in the long run, despite making gains in the short run. This short-run effect of financial leverage is consistent with the conclusion of Ghosh and Jain (2000) that the leverage ratio of US acquirers has a positive effect on the announcement period market-adjusted returns.

Overall, our multivariate regressions on CARs and BHARs using the whole sample show that managerial overconfidence has little influence on both the short-run or the long-run performance of the acquirers. Basing on the regression result, the hubris hypothesis that MAs are driven by managerial overconfidence cannot be accepted in the Chinese market.

To have a closer look at the impacts of managerial overconfidence on market performance, we divide the sample into small-sized acquirer group and large-sized acquirer group according to the acquirer's firm size. The results of the regressions are shown in Table 7. Our CARs results in Column A show that managerial confidence has no impact on the 3-day CARs in the case of small-sized acquirers. Further, stock payment has a positive effect on the 3-day CARs at the 10% level. This is consistent with the results in Table 6. Firm size has a positive effect on CARs at the 1% level. M/B has a negative influence on the acquirer's CAR at the 10% level. With regards to

large-sized acquirers, managerial overconfidence has an insignificant, negative effect on short-run performance. However, stock performance is significantly influenced by stock payments, dividends, and firm size. Our BHAR results show that the long-run performance of large-sized acquirers is significantly affected by managerial overconfidence, while the opposite holds for small-sized acquirers.

Insert Table 7 here.

In summary, the results of multivariate analyses with regards to different acquirers' size further support our prior observations that managerial overconfidence has an insignificant role in acquirers' market performance in the short run as well as in the long run.

5. Conclusion

This paper examines acquirers' market performance following the M&A announcement, and especially how managerial overconfidence on the part of acquirers influences their post-announcement market performance. We present new evidence that acquirers in China gain value through domestic acquisitions both in the short-run and the long-run. Our sub-sample analyses further show that the market has more confidence in acquirers with higher overconfidence than those with lower confidence in both the short run and the long run. Our multivariate analyses show that managerial overconfidence has an insignificant influence on acquirers' market performance in both the short and long-run after we control for a spectrum of the control variables. Our further analyses on the basis of the sub-samples by firm size substantiate our observations that managerial overconfidence plays a minimal role in acquirers' market performance both in the short run and in the long run. Our results have led us to conclude that managerial overconfidence plays only a minor role in driving China's acquisitions.

Our results appear to be inconsistent with many previous researches on developed markets, but our work has revealed idiosyncratic features and has some practical implications for investors and practitioners. The evidence that acquirers gain value after M&A deals in both the short and long-

run, and especially in those acquirers with higher managerial overconfidence, would provide suggestive guidance for investors vying for China's M&A market.

Reference

1. Aktas, N., De Bodt, E., & Roll, R. (2005). Hubris, learning, and M&A decisions. *Finance*.
2. Asquith, P., Bruner, R. F., & Mullins, D. W. (1983). The gains to bidding firms from merger. *Journal of Financial Economics*, 11(1), 121-139.
3. Barberis, N., & Thaler, R. (2003). A survey of behavioral finance. *Handbook of the Economics of Finance*, 1, 1053–1128.
4. Biais, B., & Perotti, E. (2002). Machiavellian privatization. *The American Economic Review*, 92(1), 240-258.
5. Bortolotti, B., D'Souza, J., Fantini, M., & Megginson, W. L. (2002). Privatization and the sources of performance improvement in the global telecommunications industry. *Telecommunications Policy*, 26(5), 243-268.
6. Bouwman, C. H., Fuller, K., & Nain, A. S. (2009). Market valuation and acquisition quality: Empirical evidence. *Review of Financial Studies*, 22(2), 633–679.
7. Brown, R., & Sarma, N. (2007). CEO overconfidence, CEO dominance and corporate acquisitions. *Journal of Economics and Business*, 59(5), 358–379.
8. Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of financial economics*, 14(1), 3–31.
9. Cooper, A. C., Woo, C. Y., & Dunkelberg, W. C. (1988). Entrepreneurs' perceived chances for success. *Journal of business venturing*, 3(2), 97–108.
10. De Bondt, W. F., & Thaler, R. H. (1994). Financial decision-making in markets and firms: A behavioral perspective (No. w4777). *National Bureau of Economic Research*.
11. Doukas, J. A., & Petmezas, D. (2007). Acquisitions, Overconfident Managers and Self-attribution Bias. *European Financial Management*, 13(3), 531–577.
12. Dutta, S., & Jog, V. (2009). The long-run performance of acquiring firms: A re-examination of an anomaly. *Journal of Banking & Finance*, 33(8), 1400-1412.
13. Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, 33(1), 3–56.
14. Frank, R. H. (1985). Choosing the right pond: Human behavior and the quest for status. *Oxford University Press*.
15. FU, Q., & FANG, W. J. (2008). An Empirical Research on the Manager Overconfidence and Acquisition Decision [J]. *Journal of Business Economics*, 4, 76–80.
16. Gaughan, P. A. (2010). Mergers, acquisitions, and corporate restructurings. John Wiley & Sons.
17. Ghosh, A., & Jain, P. C. (2000). Financial leverage changes associated with corporate mergers. *Journal of Corporate Finance*, 6(4), 377-402.
18. Hall, P. (1992). On the removal of skewness by transformation. *Journal of the Royal Statistical Society. Series B (Methodological)*, 221-228.
19. Hambrick, D. C., & D'Aveni, R. A. (1992). Top team deterioration as part of the downward spiral of large corporate bankruptcies. *Management Science*, 38(10), 1445-1466.
20. Harford, J. (2005). What drives merger waves?. *Journal of financial economics*, 77(3), 529-560.
21. Hartman, R. S. (1996). Predicting the efficiency effects of mergers. *Journal of Forensic Economics*, 9(3), 295–323.
22. Hayward, M. L., & Hambrick, D. C. (1997). Explaining the premiums paid for large acquisitions: Evidence of CEO hubris. *Administrative Science Quarterly*, 103–127.
23. Houston, J. F., & Ryngaert, M. D. (1994). The overall gains from large bank mergers. *Journal of Banking & Finance*, 18(6), 1155-1176.
24. Jensen, M. C., & Ruback, R. S. (1983). The market for corporate control: The scientific evidence.

- Journal of Financial economics*, 11(1), 5–50.
25. Jiang, F., Stone, G. R., Sun, J., & Zhang, M. (2011). Managerial hubris, firm expansion and firm performance: Evidence from China. *The Social Science Journal*, 48(3), 489–499.
 26. King, D. R., Dalton, D. R., Daily, C. M., & Covin, J. G. (2004). Meta - analyses of post - acquisition performance: Indications of unidentified moderators. *Strategic management journal*, 25(2), 187-200.
 27. Landier, A., & Thesmar, D. (2003, October). Financial contracting with optimistic entrepreneurs: Theory and evidence. In *AFA 2004 San Diego Meetings*.
 28. Lin, B. X., Michayluk, D., Oppenheimer, H. R., & Reid, S. F. (2008). Hubris amongst Japanese bidders. *Pacific-Basin Finance Journal*, 16(1), 121–159.
 29. Lin, Y. H., Hu, S. Y., & Chen, M. S. (2005). Managerial optimism and corporate investment: Some empirical evidence from Taiwan. *Pacific-Basin Finance Journal*, 13(5), 523–546.
 30. Loughran, T., & Vijh, A. M. (1997). Do long-term shareholders benefit from corporate acquisitions?. *The Journal of Finance*, 52(5), 1765–1790.
 31. Lyon, J. D., Barber, B. M., & Tsai, C. L. (1999). Improved methods for tests of long-run abnormal stock returns. *The Journal of Finance*, 54(1), 165–201.
 32. Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The Journal of Finance*, 60(6), 2661–2700.
 33. Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, 89(1), 20–43.
 34. Masulis, R. W., Wang, C., & Xie, F. (2007). Corporate governance and acquirer returns. *The Journal of Finance*, 62(4), 1851-1889.
 35. Mellow, E. W., Phillips, K., & Myers, C. W. (1981). Understanding cost growth and performance shortfalls in pioneer process plants. *Rand Corporation*.
 36. Minggui, Y., Xiping, X., & Zhensong, Z. (2006). The relationship between managers' overconfidence and enterprises' radical behavior in incurring debts. *Management world*, 8, 358–379
 37. Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, 73(2), 201–228.
 38. Raj, M., & Forsyth, M. (2003). Hubris amongst UK bidders and losses to shareholders. *International Journal of Business*, 8(1), 1–16.
 39. Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of business*, 197–216.
 40. Guangyin, S. Y. Z. (2010). An Empirical Study on the Relationship between Managerial Overconfidence and Corporate Mergers and Acquisitions [J]. *Chinese Review of Financial Studies*, 2, 009.
 41. Hayward, M. L., & Hambrick, D. C. (1997). Explaining the premiums paid for large acquisitions: Evidence of CEO hubris. *Administrative Science Quarterly*, 103–127.
 42. Jacobs, L., Berscheid, E., & Walster, E. (1971). Self-esteem and attraction. *Journal of Personality and Social Psychology*, 17(1), 84.
 43. Sudarsanam, S., & Mahate, A. A. (2003). Glamour acquirers, method of payment and post - acquisition performance: the UK evidence. *Journal of Business Finance & Accounting*, 30(1 - 2), 299-342.
 44. Tosi Jr, H. L., & Gomez-Mejia, L. R. (1989). The decoupling of CEO pay and performance: An agency theory perspective. *Administrative Science Quarterly*, 169-189.
 45. Trautwein, F. (1990). Merger motives and merger prescriptions. *Strategic Management Journal*, 11(4), 283–295.
 46. Wright, G. N., & Phillips, L. D. (1980). Cultural variation in probabilistic thinking: Alternative ways of dealing with uncertainty. *International Journal of Psychology*, 15(1–4), 239–257.

47. Yates, J. F., Lee, J. W., & Bush, J. G. (1997). General knowledge overconfidence: cross-national variations, response style, and “reality”. *Organizational behavior and human decision processes*, 70(2), 87–94.
48. Yates, J. F., Lee, J. W., Shinotsuka, H., Patalano, A. L., & Sieck, W. R. (1998). Cross-cultural variations in probability judgment accuracy: Beyond general knowledge overconfidence?. *Organizational Behavior and Human Decision Processes*, 74(2), 89–117.
49. Yates, J. F., Zhu, Y., Ronis, D. L., Wang, D. F., Shinotsuka, H., & Toda, M. (1989). Probability judgment accuracy: China, Japan, and the United States. *Organizational Behavior and Human Decision Processes*, 43(2), 145–171.
50. Xia, W., Min, Z., & Fusheng, Y. (2008). CEO Overconfidence and Distortion of Firms’ Investments: Some Empirical Evidence from China. *Nankai Business Review*, 2, 011.
51. Xin, Z., & China Securities Regulatory Commission. (2003). Do Mergers and Acquisitions Create Value: Evidence from Chinese Listed Companies [J]. *Economic Research Journal*, 6, 1–10.
52. Zhou, B., Guo, J. M., Hua, J., & Doukas, A. J. (2012). Does state ownership drive M&A performance? Evidence from China. *European Financial Management*.

Table 1 Descriptive statistics of Deals

Table 1 shows the time-series distribution of deal numbers and transaction value of the initial sample. The initial sample is divided into seven subsamples according to deal announced date. The domestic target subsample reports those deals with a Chinese firm as target (Domestic target) and the foreign subsample relates to those with targets located outside of China (Foreign target). The figures shown represent the number of deals and value of transactions conducted within each category by year.

	2006	2007	2008	2009	2010	2011	2012	SUM
Number of deals	63	154	257	263	272	449	495	1953
<i>Domestic target</i>	55	140	238	248	247	434	464	1826
<i>Foreign target</i>	8	14	19	15	25	15	31	127
Value of transactions (\$million)	9013	15461	26212	19467	23180	59679	40649	193661
<i>Domestic target (\$million)</i>	3852	11401	14329	16446	19539	56842	37885	160294
<i>Foreign target (\$million)</i>	5161	4060	11883	3020	3641	2837	2764	33366

Table 2 Descriptive statistics of managers' relative salary

Table 2 shows the descriptive statistics of managers' relative salary ratio in the year of deal announcement for all samples. The managers' relative salary ratio of a sample company is equal to the maximum salary of all top managers divided by the average salary of all top managers. The time-series subgroups are classified according to announcement date. Missing data are deleted when reporting.

	2006	2007	2008	2009	2010	2011	2012
Mean	3.3	3.2	3.2	3.3	3.2	3.1	3.3
Median	2.9	3.0	2.9	3.0	2.9	2.8	2.9
Maximum	11.6	9.0	11.9	12.7	7.7	10.6	11.6
Minimum	1.6	1.4	1.4	1.4	1.4	1.5	1.6
S.D.	1.5	1.1	1.3	1.5	1.3	1.1	1.5

Table 3. Basic statistics of the key variables in the estimation

Table 3 reports the basic statistics of the key variables. Cash and Stock are dummy variables which equals to one if the M&A deal is paid with 100% cash and 100% stock respectively. Diversity is a dummy variable which equals to one if the acquirer's first two-digit Standard Industry Classification (SIC) code is different from that of the target. Logrelativesize equals to the logarithm of the value of transaction divided by acquiring firm's total assets the last fiscal year before the announcement, in our model. Logtotalasset is the logarithm of the acquirer's total assets one fiscal year before the announcement date. Leverage is the ratio that equals to the long-term debt divided by total asset. M/B is the market-to-book ratio of the acquiring firm one month before the announcement date. Bgov and Sgov are dummy variables which equals to one if there is buy-side owned government involvement and sell-side government owned involvement respectively, in the M&A deal. Year and Industry are dummy variables representing for the announcement year and acquire industry, respectively. The initial sample includes all successful M&A deals undertaken by Chinese listed firms form 2006–2012.

	Cash	Stock	Diversity	Logrelativesize	Logtotalasset	Leverage	M/B	Bgov	Sgov
Mean	0.26	0.11	0.47	-5.29	6.41	6.07	5.17	0.12	0.26
Median	0	0	0	-5.32	6.31	0.87	3.14	0	0
Maximum	1	1	1	-0.92	10.13	60.84	1358.86	1	1
Minimum	0	0	0	-9.83	3.29	0.00	-74.14	0	0
S.D.	0.44	0.32	0.50	0.95	0.73	9.79	35.98	0.33	0.44

Table 4. 3–day CARs surrounding the M&A announcement

Table 4 shows 3–day CARs for acquirers with different managerial overconfidence level at the announcement day. The sample includes all successful M&A deals undertaken by Chinese listed firms form 2006–2012. The sample is divided into two subgroups according to acquiring firms’ managerial overconfidence level. Managerial overconfidence is measured with acquiring firms’ relative salary ratio, which equals to the maximum salary of all top managers divided by the average salary of all top managers in the year of announcement. Higher value of this proxy represents higher managerial overconfidence level. Group 1 and Group 2 represent the subgroups with low managerial overconfidence level and high managerial overconfidence level respectively. ***, **, * indicate the one–tail t-test (skewness corrected) significance of average CARs different from 0 at the 1%, 5%, 10% level.

Relative salary ratio is used as the proxy for overconfidence	All acquirers	Firm with lower overconfidence	Firm with higher overconfidence
Mean	0.73%***	0.67%***	0.78%**
t–value	(9.59)	(6.10)	(7.46)
Number	1688	844	844

Table 5. 24-month BHARs after the M&A announcement

Table 5 shows 24-month post-announcement BHARs for acquirers with different managerial overconfidence level. The sample includes all successful M&A deals undertaken by Chinese listed firms from 2006–2012. The sample is divided into two subgroups according to acquiring firms' managerial overconfidence level. Managerial overconfidence is measured acquiring firms' relative salary ratio, which equals to the maximum salary of all top managers divided by the average salary of all top managers in the year of announcement. Higher value of this proxy represents higher managerial overconfidence level. Group 1 and Group 2 represent the subgroups with low managerial overconfidence level and high managerial overconfidence level respectively. ***, **, * indicate the one-tail t-test (skewness corrected) significance of average CARs different from 0 at the 1%, 5%, 10% level.

Relative salary ratio is used as the proxy for overconfidence	All acquirers	Firm with lower overconfidence	Firm with higher overconfidence
Mean	13.06%***	9.24%***	16.87%***
t-value	(6.48)	(3.46)	(5.60)
Number	1715	857	858

Table 6. Multivariate regression on short- and long-run market performance

Table 6 reports the results of OLS regression on 3-day CARs and 24-month BHARs as follows:

$CARs/BHARs = c + \alpha_1 Relativessalary + \alpha_2 Cash + \alpha_3 Stock + \alpha_4 Diversify + \alpha_5 Logrelativesize + \alpha_6 Logtotalasset + \alpha_7 Leverage + \alpha_8 M/B + \alpha_9 Bgov + \alpha_{10} Sgov + \sum \beta_i Year + \sum \gamma_j Industry$, where *Relativessalary* is equal to maximum salary of all top managers divided by the average salary of all top managers from a bidding firm. *Cash* and *Stock* are dummy variables which equals to one if the M&A deal is paid with 100% cash and 100% stock respectively. *Diversify* is a dummy variable which equals to one if the acquirer's first two-digit Standard Industry Classification (SIC) code is different from that of the target. *Logrelativesize* equals to the logarithm of the value of transaction divided by acquiring firm's total assets the last fiscal year before the announcement, in our model. *Logtotalasset* is the logarithm of the acquirer's total assets one fiscal year before the announcement date. *Leverage* is the ratio that equals to the long-term debt divided by total asset. *M/B* is the market-to-book ratio of the acquiring firm one month before the announcement date. *Bgov* and *Sgov* are dummy variables which equals to one if there is buy-side owned government involvement and sell-side government owned involvement respectively, in the M&A deal. *Year* and *Industry* are dummy variables representing for announcement year and acquire industry, respectively. The initial sample includes all successful M&A deals undertaken by Chinese listed firms from 2006–2012. Deals with missing data and negative M/B ratios are deleted. ***, **, * indicate significance of coefficients different from 0 at the 1%, 5%, 10% level, respectively.

<i>Column A: The dependent variable is 3-day CARs</i>		<i>Column B: The dependent variable is 24-month BHARs.</i>	
Intercept	5.22* (1.67)	Intercept	130.8** (2.19)
Relativessalary	0.02 (0.37)	Relativessalary	2.54 (1.44)
Cash	-0.17 (-0.87)	Cash	-5.61 (-1.45)
Stock	1.05*** (3.25)	Stock	1.80 (0.23)
Diversify	-0.23 (-1.36)	Diversify	3.79 (0.90)
Logrelativesize	0.47*** (4.09)	Logrelativesize	8.27*** (2.82)
Logtotalasset	0.10 (0.68)	Logtotalasset	-3.62 (0.43)
Leverage	0.02* (1.69)	Leverage	-0.48** (-1.98)
M/B	-0.002 (-0.78)	M/B	-0.13 (-0.65)
Bgov	0.05 (0.18)	Bgov	-2.35 (-0.33)
Sgov	0.31 (1.46)	Sgov	-1.62 (-0.31)
Year & Industry	-	Year & Industry	-
Adjusted R ²	7.60%	Adjusted R ²	2.39%

Table 7 Multivariate regressions on CARs and BHARs of different size acquirers

Table 7 reports the results of OLS regression on 3-day CARs or 24-month BHARs of different size acquirers as follows:

$CARs/BHARs = c + \alpha_1 Relativessalary + \alpha_2 Cash + \alpha_3 Stock + \alpha_4 Diversify + \alpha_5 Logrelativesize + \alpha_6 Logtotalasset + \alpha_7 Leverage + \alpha_8 M/B + \alpha_9 Bgov + \alpha_{10} Sgov + \sum \beta_i Year + \sum \gamma_j Industry$, where, *Relativessalary* is equal to maximum salary of all top managers divided by the average salary of all top managers from a bidding firm. *Cash* and *Stock* are dummy variables which equals to one if the M&A deal is paid with 100% cash and 100% stock respectively. *Diversify* is a dummy variable which equals to one if the acquirer's first two-digit Standard Industry Classification (SIC) code is different from that of the target. *Logrelativesize* equals to the logarithm of the value of transaction divided by acquiring firm's total assets the last fiscal year before the announcement, in our model. *Logtotalasset* is the logarithm of the acquirer's total assets one fiscal year before the announcement date. *Leverage* is the ratio that equals to the long-term debt divided by total asset. *M/B* is the market-to-book ratio of the acquiring firm one month before the announcement date. *Bgov* and *Sgov* are dummy variables which equals to one if there is buy-side owned government involvement and sell-side government owned involvement respectively, in the M&A deal. *Year* and *Industry* are dummy variables representing for announcement year and acquire industry, respectively. Half 1 and Half 2 refer to subsample with small firm size and large firm size, respectively. Deals with missing data and negative M/B ratios are. ***, **, and * indicate significance of coefficients different from 0 at the 1%, 5%, 10% level respectively.

<i>Panel A:</i> <i>Relativessalary is included</i>	Regression on CARs		Regression on BHARs	
	Small-sized acquirers	Large-sized acquirers	Small-sized acquirers	Large-sized acquirers
Intercept	-0.11 (-0.05)	3.25* (0.96)	202.80* (1.66)	37.97 (0.59)
Relativessalary	0.09 (0.98)	-0.02 (-0.17)	-0.06 (-0.02)	5.15*** (2.76)
Cash	-0.16 (-0.58)	-0.17 (-0.60)	-4.54* (-0.52)	-8.80 (-1.80)
Stock	0.79* (1.73)	1.20*** (2.56)	6.22 (0.44)	-8.00 (-1.02)
Diversify	-0.33 (-0.01)	-0.40* (-1.63)	9.03 (1.21)	4.17 (0.98)
Logrelativesize	0.68*** (4.03)	0.34** (2.04)	14.53*** (2.70)	0.54 (0.18)
Logtotalasset	0.72* (1.70)	0.21 (1.00)	-16.81 (-1.09)	6.07 (1.19)
Leverage	0.005 (0.23)	0.02 (1.34)	0.10 (0.16)	-0.48** (-2.39)
M/B	-0.01* (-1.72)	-0.001 (-0.30)	-0.21 (-0.79)	-1.10* (-1.84)
Bgov	0.18 (0.34)	-0.001 (-0.003)	11.65 (0.68)	-5.88 (-1.00)
Sgov	0.20 (0.61)	0.28 (0.95)	6.51 (0.62)	-4.31 (-0.89)
Year & Industry	-	-	-	-
Adjusted R ²	10.02%	7.42%	2.41%	3.84%