

The Impact Of Adjustment In Capital Structure In Mergers & Acquisitions On Us Acquirers' Business Performance

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ABSTRACT

This paper examines the impact of adjustment in capital structure on 850 US acquirers' business performance, within five years after mergers. We consider both leverage changes and adjustment in leverage deficit as our independent variables, and use Return On Equity (ROE) and Return On Assets (ROA) to measure post-merger performance. We find that leverage changes have a negative impact on performance, in both the short and long run after Mergers & Acquisitions (M&A), indicating that financial flexibility contributes to acquirers' post-merger performance. The results also show that acquirers with movement toward target leverage ratio enjoy better performance after M&A, but the correlation is not significant in the long run. Therefore, high financial flexibility created by low leverage is more essential to acquirers facing costly and sophisticated post-merger integration, than target leverage ratio that minimizes financing cost immediately.

Keywords: Financial Flexibility; Target Capital Structure; Post-Merger Performance; Leverage Deficit

1. INTRODUCTION

As a status of the combination between debt and equity in assets, capital structure generally reflects the company's financing strategy. Indeed, decision-making of capital structure depends on balancing the cost and benefits of funding, and is also affected by asymmetric information, market timing and one's long-term strategy.

Capital structure exerts an impact on firm value. In the tradeoff capital structure theory, when firms reach an optimal capital structure, in which marginal benefits equal marginal costs of debt financing, they can achieve the minimum cost of capital, and therefore maximize the firm's value. However, Modigliani and Miller (1958) point out that, in a perfect market, firm value can be irrelevant to capital structure decision. The pecking order theory, popularized by Myers and Majluf (1984), argues that firms facing financing demand will, firstly, consume internal funding, then raise debt and resort to issuing equity last, because of their respective informational costs. Indeed, equity financing can be regarded by investors as a signal of firms' overvaluation. Further, as Lang, Ofek and Stulz (1996) show, firms' future growth favors a low debt level, since financial flexibility can facilitate potential investment. Despite various arguments around how to decide firms' capital structure, most studies reach agreement that firms incline to move toward their target capital structure in any way.

In a real corporate environment, adjustment in capital structure can be intentional or unintentional, ranging from financing with various resources and shares repurchasing, to experiencing big corporate events, such as divestiture, and mergers and acquisitions (M&A). According to Gugler and Konrad (2002), the advantages of signal-jamming encourage firms' senior management to adjust capital structure in an implicit and secret way, which is often a complicated corporate event with multi-level targets, such as M&A.

In this paper, we fit our study on capital structure into M&A strategies. Great changes of capital structure around mergers create an ideal environment, where we can closely observe and study the impact of leverage

adjustment on acquirers' post-merger performance. Despite the significance of adjustment in capital structure, M&A involve many specific factors, such as methods of payment and cultural difference that can affect acquirers' post-merger performance. In response, we take these factors into account in our quantitative analysis, for the leverage impact on acquirers' business performance. Adjustment in capital structure is considered to minimize financing cost, and maximize firm value. However, minimum financing cost is based on continuous long-term planning rather than just balancing the tax benefits and financial constraints that are demanded, according to current corporate environment. In particular, acquirers' adjustment in capital structure in M&A must link their premerger cost-benefit analysis on financing to the future financial demand, especially in the post-merger integration period.

Distinguished from existing literature, our study focuses both on changes of leverage ratio and adjustments in leverage deficit, and analyzes their roles in US acquirers' post-merger performance. We further compare the short-term and long-term impacts, to analyze the role of duration in financial synergy accomplishment, and the relationship between leverage and long-term strategy. The purpose of this article is to understand how leverage adjustment affects acquirers' post-merger performance. Compared with limited previous works, which examine optimal capital structure theory in a M&A situation, our main contribution is to identify the acquirers' priorities in capital structure adjustment around and after M&A, by comparing absolute leverage changes with adjustment in leverage deficit, in terms of their respective impact on acquirers' post-merger performance. Second, we take into account merger specific factors and firm characteristics, and separate their effect on business performance from that of leverage adjustment. Third, we focus not only on immediate and short-term post-merger performance, but also on long-term performance after M&A. Since leverage adjustment can be a continuous effort, we try to find out the general rationale of capital structure determination that can enhance firm value in the whole M&A process.

The remainder of our paper is organized as follows. Section 2 summarizes related theories and results in the previous literature. Data collection and variable definitions are explained in Section 3. The methodology is described in Section 4. Section 5 reports empirical results and in-depth analysis. Finally, Section 6 concludes the paper.

2. LITERATURE REVIEW

Mergers and acquisitions (M&A) are corporate strategy tools for achieving organic growth and corporate expansion. Through mergers, acquirers can increase market shares, achieve economies of scale, and obtain financial and operational synergies. Some mergers can provide acquirers with tax benefits, or eliminate competition threats. Indeed, adjusting capital structure may serve as an important financial motive behind M&A decision-making (Leland (2007)). Gugler and Konrad (2002) point out that an acquiring firm may employ M&A as a solution to adjust the capital structure, by absorbing the debt and equity of the target firm. They argue that an implicit purpose of financial restructuring can't be easily identified and separated from motives of enhancing market power or operational synergy in a merger decision. In particular, Byoun (2008) contends that when firms face financial surplus or deficit, they focus particularly on adjustment in capital structure. Therefore, since financial structure is expected to change greatly around M&A, acquiring firms will focus on capital structure targeting. After considering adjustment cost, Leary and Roberts (2005) find that firms actively rebalance their leverage, to keep themselves within an optimal range of capital structure. They argue that firm's leverage deviation results from cost of adjustment, instead of indifference toward a target capital structure. Faulkender et al. (2010) also point out that firms set an optimal range rather than an exact status of target capital structure, because it's not rewarding to fix an optimal point at the cost of repetitive adjustment.

Most M&A strategies move acquiring firms to their target capital structure. Comparing leverage deficit of acquiring firms before and after mergers, Vermaelen and Xu (2011) report that acquirers in 80% of the transactions move closer to their target leverage. Similarly, Yang (2011) finds that most acquirers reduce the deviation between actual and target leverage ratio after M&A. Therefore, acquiring firms take into consideration the adjustment in capital structure when acquirers decide to make acquisitions. But, how and to what extent can adjustment in capital structure impact acquirers' post-merger performance?

Adjustment in capital structure can be measured by either adjustment in leverage deficit (Harford et al. (2009), Uysal (2011)) or absolute change of financial leverage (Ghosh and Jain (2000), Gill et al. (2011)). However, most researchers tend to use adjustment in leverage deficit, which is supported by optimal capital structure theory. Harford et al. (2009) reveal that acquirers' post-merger operational performance declines with the movement away

from their target capital structure. They argue that firms attempt to adjust toward their target capital structure after acquisitions, to maximize the firm value in the long run. Yang (2011) argues that the business performance and market value of acquirers are improved when they bridge the difference between actual and target leverage ratio. Based on a regression model, the author demonstrates that overleveraged acquirers generally enjoy better performance than underleveraged ones. According to optimal capital structure theory, acquirers who move closer to their optimal capital structure achieve a better financial synergy. However, it requires dedicated post-merger endeavor to realize true financial synergy in the long run. Huang, Pierce and Tsyplakov (2011) identify that post-merger integration can last for 1 to 3 years, to accomplish full financial synergy. In the same context, Harford et al. (2009) conclude that financial synergies could be realized within 5 years of the merger.

Apart from financial synergy achieved by firms' movement toward an optimal capital structure, post-merger performance can also be improved by changes in absolute financial leverage. Maloney, McCormick, and Mitchell (1993) provide evidence that acquirers with higher premerger leverage obtain better market performance around M&A announcement. It seems to be a positive relationship between acquirers' post-merger performance and absolute financial leverage. Additionally, Ghosh and Jain (2000) observe that acquiring firms generally increase their financial leverage after mergers. They state that the change of financial leverage has a significant positive effect on the market-adjusted returns at the announcement period. The authors add that an increase in absolute leverage ratio may indicate an increase in debt capacity, which has positive impact on firms' performance. In contrast, Uysal (2011) examines the impact of takeover announcement on acquirers' firm value. The results show that although underleveraged firms are more likely to make acquisitions and increase their leverage ratio, short-term market reaction is often negative with regard to takeover announcements of underleveraged acquirers. One of the explanations is that capital market reaction favors a low level of financial leverage. Since increasing leverage ratio in M&A may lead to more financial distress for acquirers, investors tend to worry about firms' long-term performance. On the same issue, Yang (2011) reports a robust positive impact of reduction in leverage on cumulative stock returns. He explains that market performance rises with reducing leverage, because investors favor a low leverage ratio.

In a view of corporate strategy, M&A and capital structure both target long-term performance. Lang, Ofek and Stulz (1996) show that firms prefer a low financial leverage if returns of future investment exceed the cost of debt overhung. Goedhart, Koller and Rehm (2006) suggest that capital structure should be adjusted in accordance with long-term corporate strategies, by identifying investment opportunity, target debt and credit ratings. Moreover, Huang et al. (2011) show that the duration of post-merger integration has a negative impact on the financial leverage of combined firms after mergers. They further explain that, when managers of acquiring firms expect the post-merger integration to be time-consuming, they prefer to finance mergers with equity, and maintain a low leverage ratio. As a result, low financial leverage contributes to financial flexibility and better performance in the long run.

In summary, adjustment toward target capital structure improves acquirers' post-merger performance. The positive relationship, between firms' performance and adjustment toward target leverage ratio, has been supported by optimal capital structure theory and most empirical studies (Harford et al., 2009; Yang, 2011; ...etc). However, adjustment in absolute leverage ratio is confusing in its effect on performance. On the one hand, increasing leverage ratio shows acquirers' increasing debt capacity, and allows them to enjoy more leverage benefits, and therefore improves firm value as a whole (Maloney et al., 1993; Ghosh & Jain, 2000). On the other hand, reduction in leverage ratio contributes to post-merger performance by creating more financial flexibility, and ensuring future investment (Lang et al., 1996; Yang, 2011; Huang et al., 2011).

In this paper, we test the impact of adjustment in both leverage deficit and absolute leverage ratio on acquirers' post-merger performance. While adjustment in leverage deficit may contribute to acquirers' post-merger performance by minimizing cost of capital, adjustment in absolute leverage ratio is expected to affect acquirers' debt capacity and financial flexibility in post-merger integration.

3. DATA

To set up our empirical study, we need both firm specific data and their M&A-related information. To this end, we use two databases: OSIRIS, for collecting corporate financials, such as firms' performance and leverage ratio; and ZEPHYR, for collecting merger specific information, including methods of payment and completion date.

We chose US public firms because US has the largest and most active M&A market, and boasts an accessible and complete database. To track continuous changes in firms' capital structure and other accounting records, all selected US firms need to have available accounting information in a database, from January 1, 2001 to December 31, 2011.

Considering high financial leverage as unique characteristic in banking and insurance industries, we exclude banks and insurance companies from our sample. We also eliminate regulated utilities from our search, because utility firms often face rare market competition and have unique financial risks. Therefore, we take all other industrial firms into account, in 48 industry classifications.¹ We select our final sample randomly from the data that meet all our standards. In response to data analysis, the data selection is conducted in three steps, according to the requirements of our structuring empirical study. First, to estimate target capital structure of US acquirers, we use all US public firms, including US acquirers that conform to our overall standard from OSIRIS database. As Yang (2011) suggests, the sample that contains more than acquiring firms results in a more comparable and non-biased target leverage estimation. Further, we realize if we derive target leverage estimation from all observed acquirers, then the expectation of acquirers' leverage deficit will, mathematically, be zero. The data is examined and complimented by WRDS database. After sifting data with our search strategy, we keep a sample of 1,654 US public firms.² Second, to further focus on US acquirers, we extract 850 US acquirers from these selected public firms. Thanks to the accessibility of transferring the list of firm codes from OSIRIS to ZEPHYR databases, we can obtain data about the M&A deal, in which our sample US acquirers were involved. The selected M&A deals were completed during a period from January 1, 2003 to December 31, 2006. In particular, the deal value needs to exceed US\$1 million, because extremely small acquisitions may not have a significant impact. As a result, we finally use a sample of 1,159 M&A deals with 850 acquirers.³ Third, to include more influential factors, some variables, such as proportion of cash in method of payment, are calculated manually. For our inclusive analysis, we keep a sample of 904 deals,⁴ in which we take data for both acquiring and target firms. Since we select public firms with strict and consistent standards in the first place, we obtain sample acquirers that contain available data for at least 5 years after mergers.

4. METHODOLOGY

4.1 Target Leverage Determination

After collecting data, we firstly estimate the firms' target capital structure, based on which leverage deficit can be calculated. We employ a Tobit regression⁵ to estimate firms' target leverage ratio. Since leverage ratio fall in range of 0 to 1, Tobit regression is the most appropriate to estimate target leverage ratio. While Yang (2011) holds market leverage as the dependent variable, we adopt book leverage for our capital structure study. To our knowledge, book leverage, calculated by the ratio of total debt to the total book assets, contains less volatility, and can be tracked from reliable source. In terms of independent variables of the regression, we quantify proxies of firm size, profitability, asset tangibility, product uniqueness and growth opportunity, whose significant impact on leverage targeting is examined by Kayhan and Titman (2007), Harford et al. (2009) and Uysal (2011).

Compared with Nunkoo and Boateng (2010), who consider size, profitability, tangibility and growth, we add product uniqueness as an essential factor to our model. For the missing values, we employ the R&D dummy variable. Indeed, we incorporate the most five influential factors in the Tobit regression. The fitted value in the regression is the estimated target leverage ratio of specific firms.

The Tobit regression is established as follows:⁶

$$BL_t = \beta_1 * Sales_{t-1} + \beta_2 * EBITDA_{t-1} + \beta_3 * TAN_{t-1} + \beta_4 * RD_{t-1} + \beta_5 * RDDmy + \beta_6 * MB_{t-1} + \beta_7 * INDDmy + Cons \quad (1)$$

¹ The industry classification in this paper is based on Fama-French 48 industry portfolios (Fama and French (1997)).

² Since we used these samples in a separate annual analysis, a few firms with an abnormal value for a variable could be eliminated from a specific model.

³ Some acquirers made acquisitions more than once during the period from 2003 to 2006.

⁴ Data of target firms were sometimes missing in the database.

⁵ Tobit regression is a censored regression model with maximum likelihood estimation.

⁶ The sign of t and t-1 reflects the difference between actual leverage ratio and independent variables in a relative time period.

All variables are defined in Table 1.

Table 1: Variables and Their Measures

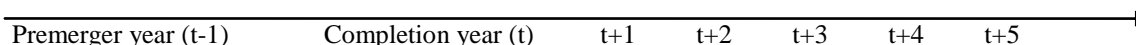
Variable	Full Name	Measure
BL	Book Leverage	(Total debt)/(total assets)
Sales	Sales	Log (sales)
EBITDA	Earnings before interests, taxes, depreciation and amortization	(Earnings before interests, taxes, depreciation and amortization)/(total assets)
TAN	Tangible assets	(Tangible assets)/(total assets)
RD	Research and Development spending	(Research and Development spending)/(sales)
RDDmy	Dummy of Research and Development spending	= 1, when RD is missing = 0, otherwise
MB	Market to book ratio	(Market capitalization)/(total assets)
INDDmy	Industry Dummy	46 Fama-French industries (excluding Banking and Insurance)
TL	Target leverage ratio	Estimated fitted value of Tobit regression
LC	Leverage changes	(Actual BL) – (pre-merger BL)
LD	Leverage deficit	(Actual leverage ratio) – (target leverage ratio)
ALD	Adjustment in leverage deficit	Current leverage deficit – pre-merger leverage deficit
TLC	Target leverage changes	(Actual target leverage ratio) – (pre-merger target leverage ratio)
ROE	Return on equity	(Net profit)/(total equity)
ROA	Return on assets	(Net profit)/(total assets)
ΔROE	Change in return on equity	(Actual ROE) – (pre-merger ROE)
ΔROA	Change in return on assets	(Actual ROA) – (pre-merger ROA)
YDmy	Year dummy	From the pre-merger year to the fifth year after mergers)
Cash	Proportion of cash paid in the deal	(Cash paid in the deal)/(total payment)
Cul	Culture dummy	= 1, in cross-border deal = 0, in domestic deal
TTOA	Relative size	(Target firm’s sales)/(acquirer’s sales)
TTOADmy	Relative size dummy	= 1, when targets’ sales missing = 0. Otherwise
ABROA	Abnormal returns on assets	(Actual ROA) – (industry average ROA)
ABROE	Abnormal returns on equity	(Actual ROE) – (industry average ROE)
ΔABROA	Changes in abnormal returns on assets	(Actual ABROA) – (pre-merger ABROA)
ΔABROE	Changes in abnormal returns on equity	(Actual ABROE) – (pre-merger ABROE)
Cons	Constant	

While Uysal (2011) and Yang (2011) used random-effects Tobit regression with a panel data, we separate annual regressions, to eliminate noise effect brought about by difference in varied periods. The advantage of separate regressions with cross-section data is to avoid the redundant variables, to enhance the significance of remaining factors. Consistent with the 48 industry portfolios’ classification, proposed by Fama and French (1997), we consider 48 industry dummies to rule out industry noise.

4.2 Leverage Adjustment Estimation

With estimated target leverage ratio, we determine and analyze the trend of firms’ leverage adjustments. Firstly, we observe how acquirers change their leverage ratio after M&A. Then, we study the trend in leverage deficit, and analyze whether acquirers tend to consume financial leverage more than their leverage targeting allows. Further, we show the distribution of change in leverage deficit to recognize acquirers’ motivation to adjust their leverage ratio to their estimated target leverage.

We illustrate the timeline as follows:



To study the impact of premerger leverage deficit on leverage changes, we set up the correlation test between premerger leverage deficit and leverage changes. The result can tell us how underleveraged and

overleveraged firms differ from each other, in terms of leverage adjustments. The regression is expressed as follows⁷:

$$LC_{t \text{ or } t+1 \text{ or } t+2 \text{ or } t+5} = \beta_1 * LD_{t-1} + \text{Cons} \tag{2}$$

The definition of variables is included in Table 1.

4.3 Performance Measure

In measuring post-merger performance, we choose return on equity (ROE) and return on assets (ROA), as acquirers’ performance measures. As the core ratio of DuPont analysis, ROE is the best accounting measure to reflect shareholder value. On the other hand, ROA is a non-biased measure of the company’s performance and stakeholder value. In our analysis, since financial leverage will magnify ROE directly but not ROA, we can separate benefits of the financial leverage to shareholders from others. Soegiharto (2010) states that better premerger performance can partly explain better post-merger performance. To eliminate premerger variation, we set the year before the completion of M&A (t-1) as the base time for controlling changes of leverage and performance measures.

The change in ROE or in ROA from premerger value is calculated as follows:⁸

$$\Delta ROA_T \text{ or } \Delta ROE_T = ROA_T \text{ or } ROE_T - \text{premerger ROE or ROA} \tag{3}$$

In this case, we focus on the improvements of specific acquirers, and eliminate difference in the premerger business performance.

4.4 Determinants of Acquirers’ Performance

Determinants of acquirers’ performance are included in the regression model. We consider changes in leverage ratio and adjustments in leverage deficit as our main independent variables. Change in leverage ratio is calculated as the difference between current and premerger leverage ratio, and leverage deficit is defined as the difference between actual and target leverage ratio. Further, the adjustment in leverage deficit is obtained as the difference between absolute value of premerger and current leverage deficit.

$$\text{Leverage deficit} = \text{actual leverage ratio} - \text{target leverage ratio} \tag{4}$$

$$\text{Adjustment in leverage deficit}_t = |\text{leverage deficit}_{t-1}| - |\text{leverage deficit}_t| \tag{5}$$

If the acquirer reduces (or increases) its leverage ratio (or leverage deficit) by 1%, we define the independent variable as -1% (or 1%). If the acquirer moves toward (or away from) its target leverage ratio by 1%, we take the variable of adjustment in leverage deficit as 1% (or -1%).

Yang (2011) considers the post-merger leverage ratio in year t, when M&A completes. Comparatively, we calculate post-merger leverage during the total observed duration, since adjustment in capital structure can be an ongoing process in post-merger integration. Harford et al. (2009) find acquirers’ managers that take a cash payment often move firms back to the target leverage within five years after the mergers’ completion. In particular, we consider premerger leverage deficit as another independent variable in our model. To explain the impact of premerger status of leverage deficit on performance, we do a univariate regression for a comparative analysis:

$$\Delta ROA_{t \text{ or } t+1 \text{ or } t+2 \text{ or } t+5} \text{ or } \Delta ROE_{t \text{ or } t+1 \text{ or } t+2 \text{ or } t+5} = \beta_1 * LD_{t-1} + \text{Cons} \tag{6}$$

All the variables are defined in Table 1.

⁷ We choose (t) for immediate effect in M&A, (t + 1) and (t + 2) for short-term and long-term effect in post-merger integration, and (t + 5) for long-term effect after M&A.

⁸ The sign of T symbolizes any year that fall in range of t to t + 5 in post-merger timeline.

In the multivariate regression analysis, we add all the considered influential firm characteristics and M&A specifics as control variables, in an inclusive regression model. We obtain equations matrix that we describe below:

Immediate impact in M&A at year t :

$$\Delta ROA_t \text{ or } \Delta ROE_t = \beta_1 * LC_t + \beta_2 * ALD_t + \beta_3 * LD_{t-1} + \beta_4 * Sales_{t-1} + \beta_5 * MB_{t-1} + \beta_6 * Cash + \beta_7 * CUL + \beta_8 * TTOA + \beta_9 * TTOADmy + \beta_{10} * INDDmy + \beta_{11} * YDmy + Cons \quad (7)$$

Early impact in post-merger procedure at year $t+1$:

$$\Delta ROA_{t+1} \text{ or } \Delta ROE_{t+1} = \beta_1 * LC_{t \text{ or } t+1} + \beta_2 * ALD_{t \text{ or } t+1} + \beta_3 * LD_{t-1} + \beta_4 * Sales_{t-1} + \beta_5 * MB_t + \beta_6 * Cash + \beta_7 * CUL + \beta_8 * TTOA + \beta_9 * TTOADmy + \beta_{10} * INDDmy + \beta_{11} * YDmy + Cons \quad (8)$$

Long-term impact in post-merger procedure at year $t+2$:

$$\Delta ROA_{t+2} \text{ or } \Delta ROE_{t+2} = \beta_1 * LC_{t \text{ or } t+1 \text{ or } t+2} + \beta_2 * ALD_{t \text{ or } t+1 \text{ or } t+2} + \beta_3 * LD_{t-1} + \beta_4 * Sales_{t-1} + \beta_5 * MB_{t+1} + \beta_6 * Cash + \beta_7 * CUL + \beta_8 * TTOA + \beta_9 * TTOADmy + \beta_{10} * INDDmy + \beta_{11} * YDmy + Cons \quad (9)$$

Long-term impact after M&A at year $t+5$:

$$\Delta ROA_{t+5} \text{ or } \Delta ROE_{t+5} = \beta_1 * LC_{t+2 \text{ or } t+5} + \beta_2 * ALD_{t+2 \text{ or } t+5} + \beta_3 * LD_{t-1} + \beta_4 * Sales_{t-1} + \beta_5 * MB_{t+4} + \beta_6 * Cash + \beta_7 * CUL + \beta_8 * TTOA + \beta_9 * TTOADmy + \beta_{10} * INDDmy + \beta_{11} * YDmy + Cons \quad (10)$$

The detailed definitions of all variables are summarized in Table 1.

5. FINDINGS

5.1 Target Capital Structure Estimation

Target capital structure estimation lays the foundation for further analysis on adjustment in leverage deficit. Tobit regression results⁹ show that all variables have a significant impact on target leverage ratio within a 99% confidence degree.

Firm size and tangibility have significant positive effect on target leverage, while product uniqueness, growth opportunity and profitability affect the target leverage level negatively. Besides, industry also plays a great role in explaining the difference of target leverage. Industry dummies are correlated significantly with firms' financial leverage in a 99% confidence degree. Variance in target leverage can be attributed partly to variant and sophisticated industry factors.

Among these variables, we find that profitability may partially reflect firms' business performance. As argued by Kayhan and Titman (2007), high profitability indicates strong market power, which prefers a lower target leverage, and thus more financial flexibility, to deter possible competition and new entries into new line of business. These results are in line with the findings in the random-effects Tobit regression, conducted by Harford et al. (2009), Uysal (2011) and Yang (2011).

5.2 Adjustment in Leverage

To observe acquirers' leverage adjustment, we calculate the fitted value as US acquirers' estimated target leverage ratio. Then we calculate leverage changes, leverage deficit and adjustment in leverage deficit, at each time point throughout the post-merger procedure. The results are summarized in Table 2.

⁹ The results of Tobit regression can be provided upon request.

Table 2: Adjustment in Leverage Ratios and Abnormal Performance of US Acquirers

Variable	Mean Median (Standard deviation)						
	t-1	t	t + 1	t + 2	t + 3	t + 4	t + 5
LC	/	0.0067 0 (0.0961)	0.0097 0.0046 (0.1144)	0.0224 0.0152 (0.1305)	0.0296 0.0198 (0.1439)	0.0327 0.0243 (0.1510)	0.0371 0.0257 (0.1524)
TL	0.4692 0.4689 (0.1119)	0.4665 0.4681 (0.1119)	0.4737 0.4772 (0.1090)	0.4853 0.4866 (0.1091)	0.4912 0.4908 (0.1091)	0.4962 0.4990 (0.1079)	0.5010 0.5016 (0.1078)
LD	-0.0011 -0.0113 (0.1520)	0.0084 0.0015 (0.1448)	0.0042 0.0010 (0.1418)	0.0052 0.0028 (0.1470)	0.0065 0.0082 (0.1488)	0.0047 0.0015 (0.1494)	0.0042 -0.0004 (0.1529)
ALD	/	0.0060 0.0054 (0.0769)	0.0081 0.0097 (0.0875)	0.0038 0.0033 (0.0984)	0.0026 0.0010 (0.1059)	0.0023 0.0026 (0.1106)	0.0012 0.0035 (0.1129)
ΔROA	/	0.0050 0.002 (0.0860)	0.0017 0.002 (0.0988)	-0.0119 -0.0012 (0.1267)	/	/	-0.0277 -0.011 (0.1367)
ΔROE	/	0.0142 0.0052 (0.2528)	-0.003 0.0024 (0.3358)	-0.03017 0.0015 (0.4145)	/	/	-0.0777 -0.0203 (0.5310)
ΔABROA	/	-0.0075 -0.0070 (0.0854)	-0.0164 -0.0131 (0.0987)	-0.0199 -0.0111 (0.1230)	/	/	-0.0233 -0.0072 (0.1379)
ΔABROE	/	-0.0178 -0.0132 (0.2574)	-0.0381 -0.0218 (0.3393)	-0.0279 -0.0023 (0.4136)	/	/	-0.03946 0.0263 (0.5286)

The mean and median of leverage changes and target leverage rise over the years following M&A. Acquirers performance, measured by ROE and ROA, keeps declining after mergers.

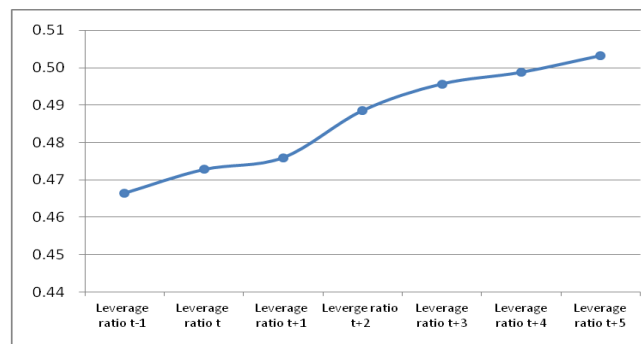


Figure 1: Changes in Leverage Ratio

Figure 1 shows a continuous increase in leverage ratios of US acquirers after mergers. This rise in financial leverage can be attributed to the increase in debt capacity. Indeed, M&A consolidate acquirers' financing resources and funding ability. In addition, this strategy often enlarges firms' lines of business, which diversify sources of cash flow and reduce business risks. US acquirers should tolerate a high financial leverage, with which they can enjoy more funding and tax benefits. Uysal (2011) argues that large firms with less volatile cash flow enjoy less financial distress, which enables them to set higher target leverage ratio.

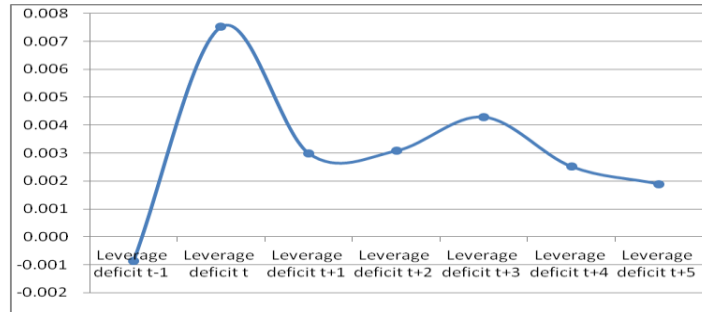


Figure 2: Changes in Leverage Deficit

The leverage deficit, as shown in Figure 2, is negative before mergers, indicating that most of acquirers are underleveraged. In the latest year after M&A, leverage deficit amounts to 0.75%. It shows that most of acquirers increase leverage ratios through mergers, and become overleveraged. After that, acquirers generally decrease their leverage deficit. In year $t+5$, the leverage deficit reduces to 0.19%. We find that most acquirers readjust the leverage ratio toward target leverage in the post-merger period, but the leverage deficit still remains positive. We recognize that the actual leverage ratio rises more than the target leverage, suggesting that acquirers generally overconsume their debt capacity in the post-merger period.

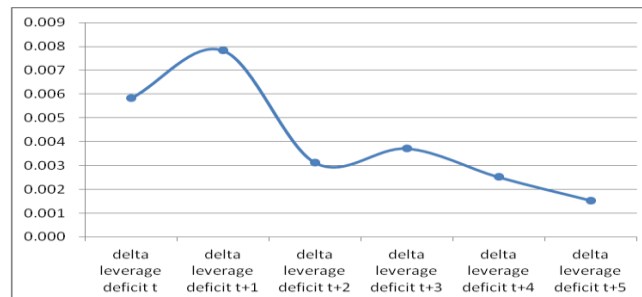


Figure 3: Changes in Absolute Leverage Deficit

In Figure 3, the adjustment in leverage deficit is always positive, indicating that most acquirers move toward optimal leverage ratio through mergers. Generally, we find that most of acquirers move toward their target capital structure abruptly by the first year after mergers. Then, they move in the opposite direction, to target capital structure and bounce back toward premerger leverage deficit. This result strengthens the argument about the optimal range of capital structure. Leary and Roberts (2005) identify that firms prefer an optimal range of target leverage rather than a fixed target.

To analyze different behaviors in leverage adjustment between overleveraged and underleveraged acquirers, we conduct a regression model, as defined in Equation 2. The results are shown in Table 3.

Table 3: The Role of Pre-Merger Leverage Deficit in Leverage Changes

Dependent Variables	Coefficient	Obs.	Adjusted R-squared
LC_t	-0.2648722 (0.000)***	1071	0.1545
LC_{t+1}	-0.330661 (0.000)***	1071	0.1924
LC_{t+2}	-0.3762508 (0.000)***	1071	0.1904
LC_{t+5}	-0.4903064 (0.000)***	1071	0.2393

The numbers between brackets give «p» value of coefficient results. ***, ** and * mean that the result is held in confidence degree of 99%, 95% and 90% respectively.

Table 3 reports that leverage deficit in (t-1) has a very significant negative effect on leverage changes. It shows overleveraged acquirers reduce leverage ratio tremendously, and underleveraged acquirers increase their leverage ratio continuously throughout the post-merger period. The results are also robust with regard to long-term leverage changes, which indicate that leverage adjustment toward a target capital structure is an ongoing long-term process.

5.3 Performance

Performance is assessed thanks to ROE and ROA.

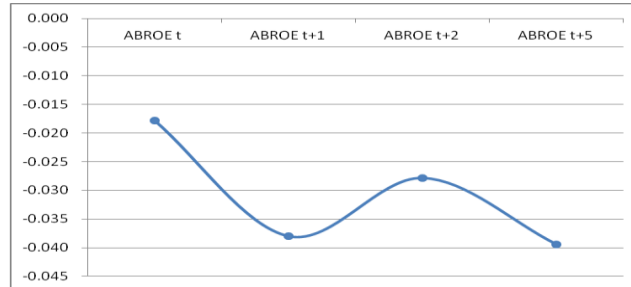


Figure 4: Changes in Deviation between Acquiring Firms’ ROE and Industry ROE

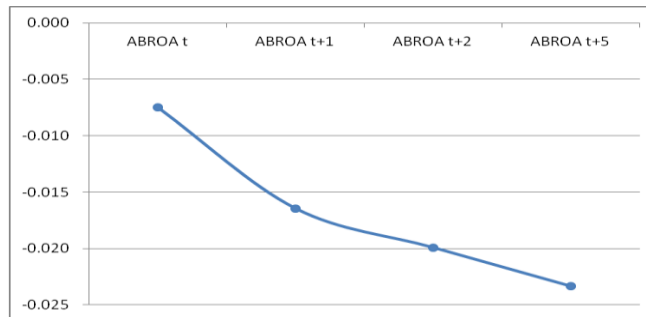


Figure 5: Changes in Deviation between Acquiring Firms’ ROA and Industry ROA

When we deduct premerger value and industry average value from the actual performance, at each time point in the post-merger procedure, changes in abnormal ROE and ROA keep declining from a negative value, corroborating the fact that acquirers suffer long-term underperforming, compared with the industry average (see Figures 4 and 5). This result, from an accounting perspective, supports mainstream theory that acquirers often suffer a loss in mergers (Tuch & O’Sullivan, 2007). In the next step, we will identify the determinants of the general underperformance.

5.4 The Impact of Leverage Adjustment on Acquirers’ Business Performance

In Equations 7–10, showing inclusive OLS regression, we determine the impact of leverage changes, adjustment in leverage deficit, and premerger status of leverage deficit on business performance. All results of Equations 7–10 are given in Table 4¹⁰.

5.4.1 The Impact of Adjustment in Leverage Deficit on ROA/ROE

We find that adjustment in leverage deficit affects both ROE and ROA significantly. In year t, the positive impact is the most significant and the strongest. Acquirers improve their ROE and ROA by moving toward an optimal capital structure after mergers. Harford et al. (2009) and Yang (2011) both report a positive impact of reduction in leverage deviation on stock returns. However, the long-term relationship between adjustment in

¹⁰ Table 4 can be provided upon request.

leverage deficit and business performance is insignificant. Therefore, leverage movement toward an optimal level contributes to firms' performance improvement, but the contribution is not considerable in the long run.

When acquirers are involved in M&A, they tend to care more about issues in capital structure. Then, intentional adjustment toward target leverage ratio may occur mostly in M&A, and also impact their business performance more positively. Nevertheless, in the long run, adjustment cost and continuous financial constraint may keep acquirers from dedicated adjustment toward target leverage. These results partly support the findings of Faulkender et al. (2010), who argue that firms tend to hold an optimal range rather than an exact point of target leverage ratio, owing to adjustment cost.

5.4.2 The Impact of Leverage Changes on ROA/ROE

The results indicate that leverage changes always hold a significant negative impact on acquirers' business performance. The impact is even robust in the long run. Why can the reduction of leverage in and after M&A promote the business performance of acquirers continuously? Indeed, financial flexibility plays a key role, especially in success in a volatile corporate environment. The payment of the deal will be demanding for acquirers' funding ability, and time-consuming, post-merger procedures are always formidable for small acquirers. A long-term post-merger integration requires the investment of both time and resources.

Actually, in our sample of US acquirers, we find that some acquirers make acquisitions more than once within four years. To grasp future growth opportunities, and facilitate ambitious corporate strategies, a high financial flexibility should be assumed and prepared. Moreover, an increasing debt capacity, proved by increasing debt level, doesn't necessarily transform into firm value. In order to obtain financial synergy, a series of financial and organizational restructuring should be conducted for effective resources integration. In this case, high financial flexibility can facilitate increasing debt capacity, and achieve real financial synergy. The overconsumption of increased debt capacity at an early stage can unintentionally rule out further potential, financial synergy achievements.

Otherwise, coefficients of leverage changes sometimes increase over the time period. This suggests that a reduction of leverage changes can impact more on long-term performance than on short-term performance. Since M&A and capital structure both focus on long-term corporate growth, the reduction of leverage ratio, based on considerate long-term planning, often aims to improve the long-term performance of acquirers. Furthermore, we find that the impact of absolute changes of financial leverage is far more significant and much stronger than that of adjustment in leverage deficit. This empirical result emphasizes further that the reduction of leverage ratio outperforms adjustment toward a target capital structure, in terms of its impact on business performance, and even on firm value as a whole.

5.4.3 The Impact of Premerger Deficit on ROA/ROE

Our findings show that in a given leverage changes and adjustment in leverage deficit, premerger leverage deficit negatively affects post-merger performance. Indeed, if two acquirers have the same leverage changes and adjustment in leverage deficit, their premerger leverage deficit can directly determine variance in their post-merger leverage status. Therefore, the negative relationship between post-merger performance and premerger leverage deficit emphasizes the positive role of low leverage ratio in performance improvement. However, when we remove control of the post-merger leverage adjustment, the relationship between post-merger performance and premerger leverage deficit, according to Equation 6, gives different results (see Table 5).

Table 5: The Impact of Pre-Merger Leverage Deficit on Acquirers’ Post-Merger Performance

Dependent variables	Coefficient (P> t)	Obs.	Adjusted R-squared
ROA _t	0.0151794 (0.367)	1076	-0.0002
ROA _{t+1}	0.0091165 (0.642)	1076	-0.0007
ROA _{t+2}	0.0678363 (0.007)***	1072	0.0059
ROA _{t+5}	0.034548 (0.217)	1071	0.0005
ROE _t	0.0698296 (0.171)	1076	0.0008
ROE _{t+1}	0.0534026 (0.435)	1076	-0.0004
ROE _{t+2}	0.090828 (0.248)	1072	0.0003
ROE _{t+5}	-0.0859128 (0.437)	1071	-0.0004

The numbers between brackets give «p» value of coefficient results. ***, ** and * mean that the result is held in confidence degree of 99%, 95% and 90% respectively.

We find an insignificant positive relationship between business performance and premerger leverage deficit, as shown in Table 5. It’s not surprising because overleveraged acquirers cut off leverage ratios, and move toward optimal leverage ratio more fiercely. Therefore, when the effect of leverage changes and adjustment in leverage deficit is not controlled, it shows that overleveraged acquirers perform better than underleveraged ones.

We realize that overleveraged acquirers tend to reduce the leverage ratio, and thus create more financial flexibility, which contributes to their better post-merger performance. In other words, it’s not the high leverage ratio, or even the increasing debt capacity, that create better performance and higher firm value after M&A. Besides, there is never a natural dual divide of underleveraged or overleveraged between all acquirers. Indeed, when two overleveraged acquirers made the same leverage adjustments in M&A, the less overleveraged firms will outperform the more overleveraged ones. Therefore, we argue that acquirers should balance current debt level and their fundamental financing ability, to decide a relatively low target leverage ratio that can create more financial flexibility, but still within an optimal range of target capital structure.

5.5 The Impact of Other Control Variables on Acquirers’ Business Performance

We include control variables, such as methods of payment, firm size, growth opportunity, relative size and cultural difference, to separate the effect of firm characteristics and M&A factors from the impact of leverage adjustments on acquirers’ post-merger performance.

Among these variables, a proportion of cash paid in methods of payment obviously has a significant positive effect on business performance, measured by both ROA and ROE, in t and t + 1. But, the significant impact is limited to short-term post-merger performance.

As Jensen (2005) contends, acquiring firms tend to use a stock payment when they feel the stock price is overvalued. In this case, we infer that a cash payment indicates expectation regarding the firms’ growth. When the board recognizes that their firm is undervalued, they will not pay with stock. According to the same theory, if shareholders feel optimistic about the future, and don’t tend to lose control of the firm, a cash payment is preferred.

Moreover, a cash payment may be based on solid funding ability, which should, in turn, relieve the tight demand on a high financial flexibility. Other than a correlation with leverage changes, a proportion of cash paid in the deal can be regarded as a positive signal to short-term post-merger performance.

In terms of firm characteristics, we find that market-to-book ratio and logarithm of sales, which are proxies of growth opportunities and firm size, both have a significant positive effect on long-term business performance.

However, in year t and year $t + 1$, the results are insignificant. We infer that the premerger market-to-book ratio may not retain its strength in the long run. In other words, a high market-to-book ratio that has been challenged by the post-merger integration can lead to better performance. As Rau and Vermaelen (1998) state, underperformance of acquirers is attributed partly to their overextrapolated high market-to-book ratio. On the other hand, larger acquirers have more resources and abilities to face unexpected challenges, and obtain higher business performance in the long run. Post-merger integration can be the key to synergy achievements. Large firms are generally more qualified to deal with cultural difference, management transformation and other integration problems. These results partly corroborate the work of Moeller et al. (2002), who find that smaller firms have higher abnormal announcement returns, but larger acquirers have higher long-term abnormal returns.

With respect to M&A specific factors, we find that only relative size has a significant negative impact on post-merger performance in year $t + 1$. When the acquirer is much larger than the target firm, the latter can be integrated more easily into the active organization. Our finding shows that acquirers may deal with the organizational difference in the year after mergers. According to common sense, the corporate difference issue should appear in an early period after mergers. This result is consistent with the finding of Kleinert and Klodt (2002).

In the remaining control variables, we find that the culture factor has no significant effect on acquirers' post-merger performance. This insignificant effect is a result of the fact that corporate cultural difference may not be identified properly by oversimplified classification, according to either domestic or cross-border mergers. Finally, an industry dummy and year variance should be taken into account, since their significance is always robust.

In conclusion, M&A specifics, such as methods of payment and relative size, exert a significant impact on post-merger performance at an early stage, while firm characteristics are more likely to affect acquirers over quite a long period.

6. CONCLUSION

The aim of the paper is to study the impact of adjustment in capital structure on US acquirers' post-merger performance. Based on a sample of 850 acquirers, we examined how, and to what extent the leverage adjustment impacts the acquirers' performance, by employing regression models.

Our findings support the view that acquirers that move their financial leverage toward target leverage ratio enjoy better business performance just after M&A than those that are indifferent to target capital structure. The result is not surprising in view of the theory of optimal capital structure. However, in the post-merger period and in the long run after M&A, it appears that movement toward optimal capital structure compromises adequate financial flexibility for enhancing long-term business performance and firm value. In contrast, we find that acquirers with a reduction in financial leverage after M&A generally have better business performance in the post-merger period, as well as a higher firm value in the long run. One interpretation of this evidence is that acquirers with high financial flexibility can deal more effectively with post-merger procedures, and achieve financial and operational synergy by potential debt-raising and further investment. Moreover, volatilities in transforming the corporate environment, as well as the economic environment, can easily tighten the financial constraints of acquirers. The empirical results also show that firms with a lower premerger leverage ratio in a given leverage change, and adjustment in leverage deficit, can have better performance. This finding emphasizes further the role that high financial flexibility plays in the performance improvements in an M&A situation.

Finally, the cash paid in a M&A deal has a significant positive impact on short-term business performance. Although a cash payment raises firms' debt level, it also enables firms' confidence, healthy financial conditions and strong funding abilities. We conclude that acquirers should balance current debt level, debt capacity and their fundamental financing ability, to decide on a relatively low target leverage ratio that can create more financial flexibility, but still stay within an optimal range.

This paper is expected to provide a new vision in setting the optimal capital structure, which takes into consideration both potential financial demand and current cost-benefit balancing. After deciding on an optimal

capital structure, acquirers still need to choose appropriate ways to adjust their financial leverage in the post-merger period. In this context, it would be interesting to study the divestiture and other actions, in which acquirers can reduce leverage in a financially demanding M&A situation.

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