Revista Argentina de Clínica Psicológica
2020, Vol. XXIX, N°4, 325-342
DOI: 10.24205/03276716.2020.832

Reexamining Merger Overpayment from the Perspective of Religiosity with a Real Option Approach

Hsiao-Fen Hsiao, Lin Lin[a]*, Pun Ngou Teng[b], Shuming Yan[c]

Abstract

This study aims to investigate the extent to which the cultural perspective of religiosity has an impact on merger overpayment. This study examines merger and acquisition (M&A) cases of American public companies over the past forty years. In accordance with past studies, we reveal that religion has a considerable impact on a company's operating behaviors. The main contribution of this study is that it is the first research to use real option measures and the REL ratio as a means of reexamining the issue of merger overpayment by testing the association between the bidder's corporate attitude toward risk modeled by the religiosity exhibited at its local headquarters along with its overpayment in a merger. In this study, we try to introduce the real option method to measure the true price of a target. The results indicate that companies with a higher Catholic-to-Protestant (CP) ratio prefer to invest more in speculative assets, such as research and development (R&D) and M&A. On the other hand, companies with higher ratio of religiosity bias then to invest more conservatively. Even high CP ratio companies tend exhibit a greater preference for risk while also merging with companies that have a high market-to-book (MB) ratio, but we have no evidence to prove that they are more likely to overpay. However, all indications point toward the notion that they will not invest irrationally. Our results prove that Overpay (offer price divided by the target's stock price) will exhibit a significant negative correlation with premiums, consistent with past studies. However, Overpay--calculated via the real option method--does not yield any significant results. As a result, we assess whether or not the real option method has appropriate applicability in cases of merger trading.

Keywords: Mergers and Acquisitions; Overpayment; Religiosity; Real Option; Local Religiosity.

1. Introduction

Deloitte (2016) reported that in 2015, the global volume of mergers and acquisitions (M&As) increased to about US$5 trillion, up 37% from 2014 and currently remaining the highest year-to-date total since 2007. However, based on Capaldo et al. (2009), this amount of M&A transactions may not reflect the "real" value of those target firms, as around 63% of the mergers may have been cases of overpayment.

[a,b,c] **New Huadu Business School of Minjiang University, China.**
Corresponding Author: Lin Lin
Email: linlin@nbs.edu.cn

Although a wide spectrum of models was employed for the purposes of firm valuation, the matter of whether the value of actual merger targets was miscalculated is still inconclusive. Probing this question from the Premium perspective, some critics point out that the merger premiums could range from 20% to 40% if the average pre-merger stock prices of the target firms involved are used as benchmark (Ferris and Petit, 2013; Fullerton, 2014). On the other hand, recent academic research indicates that the average Premium paid to a target firm is 34.73% (Fich et al., 2016), whereas it is 34.8% analyzed in prior studies (see, for example, Hartzell

et al., 2004), which is consistent with the above practical point of views. As such, it seems obvious that the main benefits of an acquisition flow toward the shareholders of the company acquired.

We are not sure yet whether the target firm is mispriced. In terms of corporate finance, there are three popular investment appraisal methods for firm valuation. They are Net Present Value (NPV), PE (Price/EPS), and Replacement Cost (RC). NPV discounts the expected cash flows that a firm can generate in the future and adds them up as a means of yielding a more accurate value of a firm. To relax some of its unrealistic and strict assumptions, its modified versions, which aim to fix different practical problems, are proposed over time. For example, Burgaud et al. (2016) recently create a Risk Adjusted Discount Rate to improve the practicality of the NPV approach by introducing more firm- or project-specific risk parameters into the formula.

PE is a ratio-based indicator which uses estimated PE multiples and the earnings per share (EPS) of a firm to calculate its market value. Apart from the PE ratio, the EV/Sales (Enterprise Value to Sales) ratio is also popular to use by professionals and the investing public alike in practice.

Finally, the RC method calculates the total costs incurred when all assets of a firm are replaced at the same or equal value. It is worth noting that the essence of RC method has recently been incorporated into the international accounting regulations and practices.

Though popular, each of these methods require adjustment within the context of company valuation in M&As. For example, Brotherson et al. (2014) reported that investment banks tend to employ the NPV method to separately capture the value of each facet of uncertainty in mergers. But in literature most papers use the matching method and thus regard the difference between the Premium of the merged firms and the average Premium of the corresponding matched sample, or industry, as an excess merger Premium. Disadvantages of these methods include being relatively static or indirect in the computation of the value of a target firm. The dynamics of these values in mergers may be better captured by alternative methods, such as real option models.

The real option model calculates the value of managerial options implicit in the project, such as its expansion, deferral, or abandonment of a project in the foreseeable future. It is also a complement to the NPV method, calculating the market value of an investment project as the sum of its NPV and its flexible managerial assets. It is a useful tool to estimate the value of speculative investments, but is not as popular as the conventional methods of investment appraisal, partly because its accuracy is highly dependent upon how realistic its assumptions are. Lukas and Welling (2012) adjusted the model to assess the values of target firms in mergers, incorporating the transaction costs, the offers in different negotiation stages, the timing decisions of a bid, and the party who initiates the merger (i.e., buyer or seller) into the model. The present study will use this model to calculate the values of sampled target firms and determine the extent to which overpayment occurs. It is the first empirical paper to introduce such a model to the existing literature on merger overpayment.

There are various reasons for merger overpayment, including the accumulation of synergies, corporate diversification, CEO overconfidence (or over-optimism), and top management's pursuit of its own interests rather than those of the firm. Among these, it seems that the CEO overconfidence hypotheses has been the topic of academic discourse for decades, dating back to the work of Black (1989). Using survey responses, Ben-David et al. (2007) revealed that over-optimistic CEOs tend to accept lower discount rates when carrying out project valuations, which consequently leads to over-investment. In mergers, it is more likely for such CEOs to project positive future activity for the merging firms in question and thus wind up overpaying in the interest of facilitating a smooth merger (Malmendier and Tate, 2008; Malmendier and Tate, 2011; Ferris et al., 2013; Hribar and Yang, 2015). It is also worth noting that male CEOs are more susceptible to overconfidence, more likely to initiate a merger, and more vulnerable to low returns on merger announcements, thus damaging the wealth of their shareholders, than are their female counterparts (Huang and Kisgen, 2013). To further this point, Paola et al. (2014) conducted a field experiment, which suggests that males are generally overconfident to begin with and that this overconfidence only grows when they believe that luck is on their side. In contrast, female overconfidence is not affected by the feeling that luck is on their side, but does shrink significantly if they believe that they have used up all the luck they can have. The work of Paola et al. (2014) provides new and interesting evidence on the CEO

overconfidence phenomenon from the perspective of gender heterogeneity.

In spite of its association with innovation (Galasso and Simcoe, 2011; Hirshleifer et al., 2012), CEO overconfidence usually leads to the distortion of resource distribution as well as confusion over the course of firm growth. As evidence of this, Malmendier and Tate (2008) reported that more than 65% of CEOs identified as being overconfident have, at one point or another, proposed aggressive M&A plans. Interestingly, however, Ferris et al. (2013) find that the firms to which overconfident CEOs belong tend to be based in countries characterized by Christianity or individualism, arguing that CEO overconfidence may be influenced by the culture that surrounds them. Their work develops a new line of research that highlights the effect of culture or religiosity on CEO overconfidence and M&A decisions (see Graham, Harvey, and Puri, 2011), which can lead to merger overpayment.

As a defining characteristic, culture has the capacity to influence post-merger performance. Culture can be seen as a set of invisible codes that mold the behavioral patterns of a group of people, particularly impacting their way of thinking, feeling, and perceiving everyday events. Stallworthy and Kharbanda (1988) note that at least 30% of failed integration cases five years after a merger occured can be attributed to cultural divergence. Dikova and Padma (2013) suggest that there is a cultural learning curve that bidders must overcome, which experienced multinational firms tend to do a better job of navigating due to cultural awareness, especially in international M&A activities.

In M&A literature, local cultural influence has been treated as a proxy for bidder attitudes toward risk. Hilary and Hui (2009) use U.S. data to directly test the relationship between Christianity (measured by *REL* ratio) and risk aversion by studying firms located in close proximity to Christian churches, and examining the extent to which their CEOs are risk-averse. Following Hilary and Hui (2009) and Ferris et al. (2013), Chen et al. (2014) bridged cultural and executive-level investment decisions by analyzing the extent to which gambling tendencies were present in given areas where firms were based and the associated risk tolerance level of those firms. The cultural variable they created was a county's Catholic-to-Protestant ratio (*CP* ratio), which turns out to be a better indicator of CEO overconfidence with respect to a firm's appetite for risk. These findings are consistent with other related papers that focus more on the effect of local culture or religiosity on corporate and individual investment decisions (e.g., Hilary and Hui, 2009; Kumar, Page, and Spalt, 2011; Callen and Fang, 2014). The major difference between them lies in the definitions of cultural influence. Another possible problem in the context of the impact of culture on businesses is that "culture" has a number of definitions and is multi-dimensional, though only few of these definitions can be analyzed rigorously through research (see, for example, Hilary and Hui, 2009; Mande and Son, 2012; Jia, 2013; Callen and Fang, 2014). For example, Chen et al. (2014) emphasize that the impact of religion on firm R&D and innovation in the U.S., finding that religious adherents tend to be risk-averse.

If, as Chen et al. (2014) claim, religiosity can be used to explain the impulsiveness or overconfidence of a CEO as it relates to engaging in risky investments, it might serve as an equally-valid explanation in the context of merger overpayment. Motivated by the literature on geographical variations in risk appetite across the U.S. (Kumar, 2009; Kumar et al., 2011), the present study aims to explore the relationship between locally-held risk tolerance and merger overpayment. Using the *REL* ratio as a means to measure cultural distinctions as a product of differences in geographical location, we can examine any potential associations in depth, thus providing complementary evidence to the existing literature (see, for example, Malmendier and Tate, 2005; Deshmukh et al., 2013; Hribar and Yang, 2013).

The main contribution of this study is that it is the first body of research to use real option measures and the *REL* ratio to reexamine merger overpayment by testing the association between a bidder's corporate attitude toward risk--modeled by location-based religiosity--and their overpayment for merger. The methodologies employed here can also be referenced in the literature, which addresses innovation as well as risk-taking investments (Shu, Sulaeman, and Yeung, 2012; Chen, Podolski, Rhee, and Veeraraghavan, 2014). In addition, as merger intentions and payment method selection also reflect a bidder's attitude toward risk, they will also be incorporated into models to clarify the impact of religiosity on those deals, as well as on post-merger performance. Although local norms have been linked with stock selection, employee compensation plans, and initial public offering returns (Kumer et al., 2011), this study will take this field of research

further to bridge the local culture-induced norms and merger overpayment. The acquiring company will be the object of interest in the present study since most early papers only focus on target companies (Zivney et al. 1996; Gao and Oler, 2012).

2. Hypotheses Development

Using market data to differentiating from previous research, this study will employ the adjusted real option model (see Lukas and Welling, 2012), to compute the value of target companies in mergers and the potential extent of overpayment by bidders. It is also worth noting that the *REL* ratio will be used to measures the firm's degree of risk aversion. A negative relation between the overpayment and *REL* is expected.

We start by linking these estimated values with local religions. According to Hilary and Hui (2009), people with religious believes tend to be risk-averse. Using the five waves of World Values Survey, Benabou et al. (2015) support this argument and further point out that greater religiosity was uniformly and significantly associated with less favorable views of risk-taking. Therefore, it may be fair to state that firms based in counties with more religious adherents may be more risk sensitive in the face of a pricing a merger. Hypothesis 1 and 2 are thus formulated as follows:

Hypothesis 1: The higher the percentage of religious adherents in a county, the less likely a firm based there is to overpay its target, given its abundant internal resources.

Hypothesis 2: The higher the percentage of religious adherents in a county, the smaller the merger overpayment of a firm based there will be.

As stated, merger overpayment usually jeopardizes the future success of the merged firm in question. Assuming that the market is at least semi-efficient, the outcomes of merger overpayment should be foreseeable, resulting in adequate responses taken by those overseeing the merger. Since a firm's overpayment behavior may be subject to its local religious atmosphere, Hypothesis 3 can formulated as follows:

Hypothesis 3: The cumulative abnormal returns (CARs) surrounding the announcement dates of mergers conducted by firms based in counties with a higher percentage of religious adherents will be larger than those conducted by firms based in counties with a lower percentage of religious adherents.

CARs in Hypothesis 3 can be replaced by BHARs or Abnormal ROAs to test the relationship of religiosity and long-term post-merger performance.

International M&As are usually riskier than domestic ones due to the problem of information transparency. Therefore, although the firms located in religious areas are normally less aggressive and more cautious, the chance and size of the overpayment in mergers conducted by them will be larger if the target's headquarters are located in a foreign county. Thus, we formulate Hypothesis 4 as follows:

Hypothesis 4: It is less likely for firms based in counties with a higher percentage of religious adherents to pay more if the targets are located in foreign counties than if the targets are domestic companies.

If Hypothesis 4 is proven to be true, given our sample, international mergers will be controlled as a dummy in our main model. Finally, it is also rational to assume that in normal situations, a bidder should stop targeting another firm if the real option value of the acquisition of that firm appears to be negative. Accordingly, Hypothesis 5 can thus be addressed as follows:

Hypothesis 5: It is less likely for a firm based in a county with a higher percentage of religious adherents to acquire potentially value-destructive targets than it is for a firm based in a county with a lower percentage of religious adherents

3. Data and Research Design

3.1 Data and sample selection

Our starting sample will consist of all U.S. mergers with announcement dates between 1990–2015 available in the M&A database of the Securities Data Company. Sampled companies must be publicly listed and their M&A deals must be coded as: "stock swap," "tender offer," "tender/merger," "completed," or "withdrawn." Deals for divestitures, repurchases, self-tenders, and minority acquisitions (purchases of ownership less than 50%) will be excluded. The deals will not go into the final sample if the bidder's financial accounting information and market data are not available via COMPUSTAT or the Center for Research in Security Prices (CRSP). The county-level data of different religious adherence can be downloaded from the American Religion Data

Archive (ARDA). The market-level data of different religious adherence can be downloaded from DATASTREAM.

3.2 Measuring the Value of Targets: Adjusted Real Option Approach

Following Lukas and Welling (2012), assuming the value of a target firm is V_t at time t, a bidder, based on the information received, is willing to offer $\theta V_t (\theta > 1)$ to buy this target. Both parties are assumed to be risk-neutral, and the value of the target firm is uncertain over time. The time-varying pattern can thus be expressed by an arithmetic Brownian motion process.

$$\mathrm{dV(t)} = \eta \mathrm{V(t)dt} + \sigma \mathrm{V(t)dW(t)}, \mathrm{V(0)} = V_0 \quad (1)$$

where σ^2 is the volatility of the target value, η is the growth rate of the target value, and dW (t) can be seen as an increment of a Wiener process with zero mean, with variance equal to dt. With merger Premium φ, which is usually greater than zero, the buyer will pay φV_t to the selling party for the target. Provided that the transaction cost is A, the selling party will not incur a loss if $\varphi > 1 - \mathrm{A}/V_t$, while the buyer will not incur a loss if $\varphi \leq \theta - \mathrm{A}/V_t$, creating a merger surplus of $(\theta - 1)V_t - 2A$. Given no further negotiation or counteroffer, the selling side can either accept the bid or decide to wait, while the buying party can adjust φ at any point in time in order to generate profits.

Lukas and Welling (2012) argue that this managerial flexibility can be valued via the real option method by relying on a Markovian Perfect Nash Equilibrium to determine the equilibrium strategy for both parties. Accordingly, to find the value of the option of acquiring this target firm, we maximize the following function:

$$\mathrm{F(V)} = \max_{\tau} E[(a(\psi)V_\tau - A)e^{-r\tau}] \quad (2)$$

where $\mathrm{E}[.]$ stands for the expectation operator and r is the risk-free rate. We would expect the bidding firm to try to stick to Premium φ and thus maximize the following function:

$$\mathrm{F(V)} = \max_{\varphi} E[(c(\psi)V^*(\psi) - A)e^{-r\tau^*}] \quad (3)$$

Solving Eq. (2) and Eq. (3), the optimally-demanded Premium will be determined subject to which party initiates the merger, as follows.

i. $\psi_s = \frac{\beta\theta+\beta-1}{2\beta-1}$ if the offering party is the seller/target (4)

ii. $\psi_b = \frac{\beta\theta+\beta-\theta}{2\beta-1}$ if the offering party is the buyer/acquirer (5)

where $\beta = \frac{1}{2} - \frac{\eta}{\sigma^2} + \sqrt{\left(\frac{\eta}{\sigma^2} - \frac{1}{2}\right)^2 + \frac{2\gamma}{\sigma^2}} > 1$.

According to the above-summarized derivation in Lukas and Welling (2012), the financial accounting information required to find optimal premiums includes the firm's price volatility, growth rate, and discount rate. Transaction cost A will be assumed to be 8% of the total transaction value, as Howitt (1994) reports. In any case, a specific merger will be determined by the difference between the real Premium and the theoretical optimal Premium, calculated in this study as shown in the above equations.

3.3 Measuring Religious Influence

Following Hilary and Hui (2009), in this study a local religion-based measure, Degree of religiosity (*REL*), will be used as a proxy for the degree of risk tolerance of firms (or their CEOs) headquartered in specific areas. *REL* can be defined as the percentage of religious adherents in a population within a specific county. The data of religious adherents across the U.S. are available through the ARDA. The Churches and Church Membership files contain county statistics that are updated every ten years for 133 Judeo-Christian church bodies. Since the time period in question is 1990–2014, we will use datasets for 1990, 2000, 2010. According to Hilary and Hui (2009), the state with highest *REL* is Utah (74.57%) and the lowest is Oregon (31.16%). The reason why we use only U.S. church membership datasets is that the U.S. population is predominantly Christian (average *REL* is about 53%), making the adherents of other religions (e.g., Buddhism, Dao, Hinduism *etc.*)[1] relatively smaller in percentage to show significance in models. The total population of a county and other county-level economic, political, and demographic information such as education come from the U.S. Census Bureau. Our models will control for these county-level variables.

We then match the location of a sampled firm's headquarters with county-level information by using Company Location Codes from COMPUSTAT. The missing data will be supplemented by hand-collecting population information of the city or state most close to the headquarters of these firms. Although Pirinsky and Wang (2006) and Hilary and Hui (2009) alert that issues arise if firms relocate

[1] More details of religions across countries can be found in ReligionFacts (www.religionfacts.com/).

their headquarters, we can mitigate this problem by checking the profile of each sampled firm on their own websites.

3.4 Firm-level Controls

Following Ferris et al. (2013), some popular firm-level controlling variables will be considered here. These include the logarithm of assets (firm size effect), bidder Tobin's Q (growth opportunity), returns on investment (defined as the sum of earnings excluding extraordinary items and depreciation normalized by capital investment), book leverage, profitability (operating cash flow scaled by total assets), and bidder Z-score (financial soundness effect). If the sampled firms are indexed into S&P 500 membership, the dummy variables will take the value of 1. Otherwise they will take the value of 0. Finally, to control for time trends, year and industry dummies will be included in the model.

3.5 CEO Characteristic Controls

CEO risk-taking behavior could be the product of their overconfidence or religious principles (see Malmendier and Tate, 2008; Ferris, Jayaraman, and Sebherwal, 2013). To capture the impact of religiosity on a CEO's M&A decisions, the overconfidence effect should be well controlled in models.

In this study, following Malmendier and Tate (2008), an overconfident CEO (*OC*) will be defined as one who postpones the exercise of their vested stock options when such options comprise at least 67% of all money. Each year the average realizable value per option that a CEO holds will be calculated by dividing the total realizable value of the options by the total number of options that they hold. The estimated strike price, following Campbell et al. (2011), is the fiscal year-end stock price minus the average realized value per option. The average money-ness of the options that a CEO holds will be calculated as the stock price divided by the estimated strike price for each option. This *OC* variable equals 1 if a CEO is found to have overconfident behavior, and 0 otherwise. Two more related control variables are the proportion of company stocks held by a CEO at the beginning of each year, and the number of options exercisable within the first six months of the beginning of each year normalized by total shares outstanding.

3.6 Announcement Returns of Bidders

The market reaction is mainly calculated by the widely-used market model, a practical version of the Capital Asset Pricing Model. The estimation window is days (−216, −40) prior to the merger, or merger Rumor announcement date. The proxy of market portfolio is the value-weighted CRSP index. The first measure of firm performance is the widely-used cumulated abnormal return (CAR). Following Lyon et al. (1999), controlling for the firm size, book-to-market, and pre-acquisition return, the second measure of post-merger firm performance in this study is the popular buy-and-hold abnormal return two years after the mergers (*BHAR*). Finally, the ratio of earnings before interest and taxes (EBIT) to total assets (i.e., EBIT/Total Assets) is used as a proxy of operating performance (ROA). Because ROA could be affected by industry-wide factors, we subtract the median ROA for all COMPUSTAT firms with the same primary two-digit SIC codes to estimate an AR (1) model to clarify the linearity between pre-merger and post-merger performance. The residual from this AR (1) regression is the third measure of abnormal return, Abnormal ROA. The CAR, BHAR, and Abnormal ROA are computed for any possible extension of our hypotheses later.

3.7 Other Controlled Variables

Chen et al. (2007) suggests some other controlled variables, which are usually employed in regressions, including merger for diversification (equal to 1 if the 2-digit SIC codes of the bidders and their corresponding targets are not the same, and 0 otherwise), cash offer (equal to 1 if it is a 100% cash offer, and 0 otherwise), and size difference (computed as the transaction value divided by the bidder's equity market capitalization one quarter prior to the merger announcement date). Each of these variables will be included in our models.

4. Empirical Model

We use the following logistic regression specification to test hypotheses 1, 2, 4 and 5 in the present study:

$$Y_{it} = F(\beta_0 + \beta_1 Religiosity_{it} + X'_{it}B) \quad (6)$$

where *religiosity* is expressed by *REL* ratios measuring local religious influence on a firm's attitudes toward risks, and X is a set of controlled variables. Y is binary, where it takes a value of 1 if: (1) a firm is found to overpay its target during the observation period (Hypothesis 1), (2) a firm's overpayment is ranked in the top 30th percentile in the sample (Hypothesis 2), and (3) the merger is a cross-border acquisition (Hypothesis 4) or the real

option value of a merger is positive to the bidder (Hypothesis 5) during the observation period. If any of these criteria are not met, Y takes a value of 0.

Next, Eq. (7) is a linear regression model where announcement effects and post-merger performance will be computed to test Hypothesis 3. In this model, the relationship between REL, CAR, BHAR, and Abnormal ROA will be established. Its empirical results will conclude whether the local religious culture is a value-creation ($\gamma_1 > 0$) or value-destruction ($\gamma_1 < 0$) factor in a merger.

$$CAR_i = \gamma_0 + \gamma_1 Religiosity_i + X_i'G + \varepsilon_i \quad (7)$$

Of course, *CAR* in Eq. (7) can be replaced by BHAR and Adjusted-ROA to measure the long-term performance of combined firms.

4.1. Empirical Results

Table 1 shows summary statistics of our main variables, which we use to infer the results of our regression estimates. The mean and median values of Premium are −0.049 and −0.05. This shows that the acquiring company's stock price will go down on average 4.9% upon announcement. The Overpay average is 1.156, indicating that the acquiring firm paid 1.156 more than the target company's market value in order to execute the acquisition. This result complies with our initial expectation, in that acquiring firms have to pay target firms a price no less than its market value (including the transaction cost, etc.). The average MV and ROA of an acquiring firm are 7.153 and 3.9%. On the other hand, the average MV and ROA of a target firm are 5.506 and −2%. This number indicates that on average, the size of the acquiring firm is more than ten times larger than that of the target firm, making it easier to merge the company with poor earning capacity.

Table 1. Summary Statistics

Table 1 presents the summary statistics of main variables and controlled variables in this thesis. Premium is defined as the cumulative abnormal return of an acquiring firm from five days prior to an announcement to five days after an announcement (CAR (−5, +5)). Overpay is defined as the offer price divided by a target firm's stock price at the time of announcement. ACP ratio (TCP ratio) is the CP ratio of the area where the acquiring firm (target) settles. AREL (TREL) is the Adherent ratio of the area where the acquirer (target) settles. Rumor is a dummy variable. It is equal to 1 if rumors exist prior to the announcement of the merger. Otherwise, it equal to 0. TR&D is defined as a target's research and development expenditure divided by total assets in the year prior to a merger. AROA (TROA) is defined as an acquirer's (target's) return on assets in the year prior to a merger. ASIZE (TSIZE) is defined as an acquirer's (target's) LN (market capitalization) in the year prior to a merger. ACAPEX (TCAPEX) is defined as an acquirer's (target's) capital expenditure divided by total assets in year prior to a merger. AMB (TMB) is defined as an acquirer's (target's) market value divided by book value in the year prior to a merger.

	N	Avg	Std	Min	Median	Max
Premium	10506	-0.049	0.106	-0.385	-0.05	0.462
Overpay	8126	1.156	0.231	0.609	1.088	2.244
ACP ratio	11682	4.318	5.045	0	2.630	62.17
AREL	11727	0.542	0.127	0	0.545	1.645
TCP ratio	13646	4.558	5.201	-0.02	2.996	59.74
TREL	13697	0.528	0.126	0	0.529	1.571
Rumor	15345	0.053	0.224	0	0	1
TR&D	3045	0.100	0.091	5.153	0.075	0.459
AROA	10396	0.039	0.118	-0.82	0.047	0.371
ASIZE	10374	7.153	2.230	1.329	7.126	14.97
ACAPITAL	10400	0.045	0.050	1.890	0.031	0.307
AMB	9671	2.542	2.702	-12.6	1.77	43.71
TROA	7429	-0.02	0.180	-0.91	0.021	0.371
TSIZE	7686	5.506	1.976	1.312	5.380	11.33
TCAPITAL	7577	0.050	0.054	9.843	0.033	0.308
TMB	7232	2.406	3.148	-56.8	1.67	39.34

Table 2 shows that a significant negative correlation exists between Premium and Overpay. Clearly, stock market investors do not value companies that spend excessively in efforts to merge with a target firm. The correlations between Rumor, TR&D, and religion point in the same direction. Acquiring companies that settle in an area that is characterized by a higher percentage Catholic population, are more likely to leak information before the official announcement date in the interest of pushing up their company's stock price. They also tend to acquire companies with higher R&D. This demonstrates that the CP ratio will lead managers to take more risks. On the contrary, the REL (religion ratio) shows the result in contrast to the CP ratio (though it is not significant between Rumor and REL). Unfortunately, we cannot find a significant result between religion and Overpay in this table. But our result demonstrates that the CP ratio will trigger a significant increase in the acquiring firm's stock price after the merger is announced, while REL reports the opposite outcome.

Table 2. Correlation Matrix

	Premium	Overpay	ACP ratio	AREL	TCP ratio	TREL	Rumor	TR&D	AROA	ASIZE	ACAPITAL	AMB	TROA	TSIZE	TCAPITAL	TMB
Premium	1															
Overpay	-.084**	1														
ACP ratio	.111**	-.028*	1													
AREL	-.082**	-.020	.194**	1												
TCP ratio	.097**	-.013	.447**	-.021*	1											
TREL	-.049**	-.008	-.027**	.248**	.215**	1										
Rumor	.031**	.054**	.089**	-.011	.091**	-.006	1									
TR&D	.070**	.052*	.167**	-.139**	.138**	-.168**	-.057**	1								
AROA	.024*	-.037**	-.036**	.033**	-.015	.021*	.055**	-.088**	1							
ASIZE	.036**	-.096**	.108**	.054**	.129**	-.004	.304**	-.053**	.275**	1						
ACAPITAL	.005	-.014	-.093**	-.002	-.090**	.011	-.018	-.060**	.099**	.060**	1					
AMB	.059**	.000	.078**	-.057**	.085**	-.027*	.057**	.093**	.141**	.243**	.120**	1				
TROA	-.052**	-.046**	-.116**	.054**	-.107**	.070**	.064**	-.391**	.210**	.100**	-.015	-.120**	1			
TSIZE	-.026*	-.081**	.029*	.023	.063**	.050**	.371**	-.250**	.181**	.601**	.052**	.085**	.283**	1		
TCAPITAL	-.003	-.018	-.110**	.045**	-.117**	.022	-.012	-.093**	.056**	.043**	.438**	.061**	.034**	.110**	1	
TMB	.023	.001	.075**	-.016	.072**	-.027*	.092**	.150**	.049**	.173**	.055**	.221**	-.096**	.149**	.088**	1

Table 2 presents the Correlation Matrix of main variables and controlled variables in this thesis. Premium is defined as the cumulative abnormal return of an acquirer from five days prior to the announcement to five days after the announcement (CAR (−5, +5)). Overpay is defined as offer price divided by target's stock price in announcement price. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. **, and * indicate statistical significance at 1 and 5 percent, respectively

Table 3 presents the regressions of religion with TR&D (target's research and development expenditure). Here, we separate the independent variables into three regressions (Acquirer, Target, and Combined). In column 1, we report the regressions of TR&D with AREL and all acquirer controls. We obtain a coefficient of 0.002 (6.699) for the ACP ratio and a coefficient of −0.09 (−5.64) for AREL, which is statistically significant at the 1% level. This result is further evidence that when an acquiring firm settles in an area characterized by a higher CP ratio, the acquirer will be open to merging the target firm even in the face of a higher degree of speculation. On the contrary, companies based in areas with a higher degree of religious adherence will operate more conservatively. Column 2 produces a result similar to that of column 1. We obtain a coefficient of 0.001 (6.663) for the TCP ratio and a coefficient of −0.13 (−9.78) for TREL, which is statistically significant at the 1% level. These results indicate that companies with a higher CP ratio prefer to invest more in speculative assets. Firms with a higher religion ratio, however, will be more conservative. In column 3, we examine the regression with all variables, yielding the same conclusion as those from the previous regressions.

Table 3. Tendency of Risk-Taking in Different Religion Ratios

Table 3 presents the regression analysis of religion and TR&D. The regressions are estimated using OLS. TR&D is defined as a target's research and development expenditure divided by total assets in previous year of merger. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively

	(1)	(2)	(3)
Intercept	0.113***	0.188***	0.195***
	(6.077)	(14.94)	(9.877)
ACP ratio	0.002***		0.001***
	(6.699)		(4.051)
AREL	-0.09***		-0.10***
	(-5.64)		(-5.95)
TCP ratio		0.001***	0.001***
		(6.663)	(3.075)
TREL		-0.13***	-0.12***
		(-9.78)	(-5.95)
AROA	-0.02		0.000
	(-1.50)		(0.018)
ASIZE	-0.00		0.005***
	(-0.82)		(3.816)
ACAPITAL	-0.00		-0.05
	(-0.15)		(-0.79)
AMB	0.001**		0.000
	(2.359)		(1.369)
TROA		-0.12***	-0.12***
		(-13.6)	(-10.1)
TSIZE		-0.00***	-0.01***
		(-9.28)	(-7.99)
TCAPITAL		-0.07*	-0.01
		(-1.87)	(-0.34)
TMB		0.003***	0.003***
		(8.629)	(5.984)
Year dummy	Yes	Yes	Yes
Adj.R square	.077	.269	.288
F value	4.236	21.431	11.687
N	1586	2272	1240

Table 3 provides credible evidence that religion will have an impact on a manager's investment tendencies. In table 4, we separate the religion variables into high- and low-level factors according to their median and test the remaining variables to see whether they will present significant differences.

In table 4, we find the significant difference of Rumor and TR&D in each variable associated with religion (consistent with the previous table). As our initial hypothesis, we assume that a risk-taking manager will be willing to pay more to execute a deal. The difference in TMB between high and low ACP ratios is 0.364 (4.429), which is statistically significant at the 1% level. These results indicate that high CP ratio companies prefer merging with target companies that have high MB ratios, implying that the company's stock price is more likely to be overestimated by investors because of it is potential. However, the difference of Overpay between high and low ACP ratios is −0.014 (−2.468), which is statistically significant at the 5% level. Furthermore, we found that mergers executed by companies--acquiring or target--with high CP ratios, are more likely to be considered sound business, leading to a significant increase in the acquirer's stock price and demonstrating a result contrary to that seen with respect to the REL ratio. This provides ample evidence that risk-taking will not contribute adversely to a firm's profits, as such behavior may be perceived as aggressive but not irrational.

Table 4. Hypothesis Tests for Variance Between High – and Low-Religion Populations

Table 4 presents the hypothesis tests for variances of all variables between high- and low- religion populations. Premium is defined as cumulative abnormal return of acquirer from five days prior announcement to five days after announcement (CAR (−5, +5)). Overpay is defined as offer price divided by target's stock price in announcement price. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger.

	ACP ratio				AREL				TCP ratio				TREL			
	High	Low	Different	t value	High	Low	Different	t value	High	Low	Different	t value	High	Low	Different	t value
Premium	-0.039	-0.06	0.02	8.767	-0.056	-0.043	-0.013	-5.6	-0.041	-0.056	0.015	6.891	-0.052	-0.045	-0.007	-3.281
Overpay	1.153	1.167	-0.014	-2.468	1.158	1.161	-0.003	-0.588	1.156	1.156	0.000	0.025	1.155	1.157	-0.002	-0.318
Rumor	0.061	0.035	0.026	6.568	0.046	0.049	-0.002	-0.593	0.072	0.043	0.030	7.453	0.055	0.059	-0.004	-0.953
TR&D	0.114	0.078	0.036	8.819	0.090	0.113	-0.024	-5.720	0.110	0.087	0.023	6.331	0.086	0.114	-0.028	-8.087
AROA	0.033	0.041	-0.008	-3.164	0.040	0.032	0.008	2.996	0.036	0.041	-0.005	-1.985	0.041	0.036	0.005	1.961
ASIZE	7.205	6.735	0.470	9.924	7.046	6.911	0.135	2.844	7.420	6.944	0.476	10.366	7.145	7.242	-0.098	-2.116
ACAPEX	0.042	0.048	-0.006	-4.905	0.046	0.044	0.002	1.927	0.043	0.049	-0.006	-5.316	0.046	0.045	0.001	0.883
AMB	2.669	2.286	0.383	6.143	2.359	2.611	-0.252	-4.054	2.798	2.321	0.477	8.207	2.449	2.691	-0.242	-4.140
TROA	-0.039	0.002	-0.041	-8.974	-0.012	-0.028	0.015	3.193	-0.042	-0.005	-0.037	-8.694	-0.010	-0.040	0.030	6.842
TSIZE	5.486	5.395	0.091	1.744	5.452	5.440	0.012	0.235	5.624	5.397	0.228	4.850	5.586	5.469	0.117	2.489
TCAPEX	0.045	0.054	-0.009	-6.280	0.052	0.046	0.006	4.003	0.046	0.056	-0.010	-7.600	0.052	0.049	0.003	2.345
TMB	2.506	2.143	0.364	4.249	2.278	2.406	-0.128	-1.461	2.586	2.174	0.413	5.436	2.275	2.525	-0.250	-3.312

In tables 2–4, we prove that religion has a strong connection with manager behavior, though table 4 disproves the notion that any connection exists between Overpay and religion. In order to further examine whether religion is related to Overpay or not, we generate the appropriate regressions in table 5, measuring the relation between Overpay and religious variables.

In columns 1 and 2 of table 5, we find that the coefficients of the CP ratio for acquiring and target firms, are nearly equal to zero. For its part, the REL exhibits negative coefficients with Overpay at the 10% level. This result indicates that the CP ratio will not affect the deal price in a merger. The CP ratio contributes to more risk-seeking in investment than other religions but is also associated with reasonable price-setting according to market prospects. When dividing the sample across religious and agnostic lines, we find that firms with higher religious ratios are less likely to pay more than the market value for a target firm, though these findings are not strongly significant.

Table 5. Overpay in Different Religions with Individual Risk Propensity

Table 5 presents the regression analysis of religion and Overpay. Overpay is defined as offer price divided by target's stock price in announcement price. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively

	(1)	(2)	(3)
Intercept	1.211***	1.269***	1.274***
	(35.73)	(32.27)	(32.00)
ACP ratio	-0.00		-8.54
	(-0.44)		(-0.10)
AREL		-0.06*	-0.07*
		(-1.74)	(-1.92)
TCP ratio	-0.00		7.192
	(-0.33)		(0.083)
TREL		-0.07*	-0.07*
		(-1.88)	(-1.77)
Rumor	0.086***	0.081***	0.082***
	(4.074)	(3.855)	(3.889)
AROA	0.003	0.010	0.006
	(0.070)	(0.198)	(0.123)
ASIZE	-0.00	-0.00	-0.00
	(-0.62)	(-0.64)	(-0.55)
ACAPITAL	0.211*	0.201*	0.212*
	(1.801)	(1.725)	(1.804)
AMB	0.002	0.001	0.001
	(1.131)	(0.858)	(0.879)
TROA	-0.06**	-0.06*	-0.06*
	(-2.04)	(-1.88)	(-1.89)
TSIZE	-0.01***	-0.01***	-0.01***
	(-3.67)	(-3.54)	(-3.51)
TCAPITAL	-0.07	-0.02	-0.05
	(-0.67)	(-0.25)	(-0.46)
TMB	0.001	0.001	0.000
	(0.657)	(0.599)	(0.543)
Year dummy	Yes	Yes	Yes
Adj.R square	.024	.027	.028
F value	2.411	2.575	2.517
N	2306	2321	2306

Measuring the extent of overpay according to a target firm's market value, as it has been done in previous literature, may not be appropriate in all situations. Trying to approximate real value, we calculate a reasonable deal price using the real option method proposed by Lukas and Welling (2012) at a different growth rate. In table 6, the dependent variable of column 1 is Overpay, which is same as that of the previous table. The dependent variable of column 2 is Overpay (MV option), which is calculated via the real option method for the growth rate of its market value. Finally, the dependent variable of column 3 (Overpay (NS option)) is calculated via the real option method for the growth rate of its Net income.

Unfortunately, as a result of table 6, there is no evidence that Overpay, which is based on the benchmark calculated via the real option method, will connect to religion. This result implies two probable situations:

1. The connection between religion and Overpay (real option) is limited.
2. The benchmark calculated via the real option does not represent the true price of the target firm.

Table 6. Overpay (Real Option) in Different Religions with Individual Risk Propensity

Table 6 presents the regression analysis of religion and Overpay (real option). Overpay is defined as offer price divided by target's stock price in announcement price. Overpay (MV option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's market value. Overpay (NS option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's net income. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively

	(1)	(2)	(3)
Intercept	1.274***	0.995*	3.554*
	(32.00)	(2.124)	(3.154)
ACP ratio	-8.54	-0.00	-0.00
	(-0.10)	(-0.70)	(-0.04)
AREL	-0.07*	0.213	-0.64
	(-1.92)	(0.483)	(-0.67)
TCP ratio	7.192	-0.00	0.024
	(0.083)	(-0.27)	(1.034)
TREL	-0.07*	0.335	0.129
	(-1.77)	(0.670)	(0.108)
Rumor	0.082***	-0.29	0.407
	(3.889)	(-1.16)	(0.893)
AROA	0.006	-2.82***	0.153
	(0.123)	(-3.14)	(0.098)
ASIZE	-0.00	-0.05	-0.12
	(-0.55)	(-1.50)	(-1.39)
ACAPITAL	0.212*	0.329	-3.32
	(1.804)	(0.225)	(-0.99)
AMB	0.001	0.019	-0.04
	(0.879)	(0.840)	(-0.99)
TROA	-0.06*	4.603***	1.784*
	(-1.89)	(3.689)	(1.788)
TSIZE	-0.01***	-0.01	-0.09
	(-3.51)	(-0.37)	(-1.02)
TCAPITAL	-0.05	-2.07	-0.50
	(-0.46)	(-1.49)	(-0.16)
TMB	0.000	-0.03	-0.02
	(0.543)	(-1.27)	(-0.64)
Year dummy	Yes	Yes	Yes
Adj.R square	.028	.032	.004
F value	2.517	1.638	1.075
N	2306	855	702

Past studies assume all stock market investors are rational. The stock price will go down when a firm's manager does something harmful that is not to the benefit of shareholder. As such, we believe that through Overpay, the acquiring firm pays more than necessary, which will trigger a drop in the acquiring firm's stock price.

In table 7, we assume Overpay has a negative significant influence on Premium (Cumulative Abnormal Return from five days prior to five days after the announcement). In column 1, as was our assumption, we obtained a coefficient of −0.059 (−6.098) on Overpay, which is statistically significant at the 1% level. The firm's market value is decided by stock market investors. If the acquiring firm trades in a price greater than the investor's prediction, this transaction will be thought of as a mistake and be reflected in the acquiring firm's stock price. The result of column 1 is identical with our expectation and proves our assumption. In table 6, we are confused as to whether religion is irrelevant to real option prices, or whether something went wrong when we calculated the price via the real option method. As a result of column 1, we believe that we will obtain a similar result in column 1 when substituting Overpay (real option) for Overpay, if real option prices do indeed represent true prices.

Unfortunately, columns 2 and 3 indicate that there is not any relation between Overpay (real option) and Premium, reflecting the fact that real option prices cannot be used to estimate a target firm's true price. We believe that calculating the variables using the real option method is critical to estimating a firm's value, as many variables, such as growth rate and transaction costs in this equation could not be standardized or collected, and most of the variables can only be approximated but not calculated accurately. This method may lead to mistakes in estimating a given firm's value.

Table 7. Degree of Overpay (real option) to Acquirer Premium After Announcement

Table 7 presents the regression analysis of Overpay (real option) and Premium. Premium is defined as cumulative abnormal return of acquirer from five days prior announcement to five days after announcement (CAR (−5, +5)). Overpay is defined as offer price divided by target's stock price in announcement price. Overpay (MV option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's market value. Overpay (NS option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's net income. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively

	(1)	(2)	(3)
Intercept	0.056**	0.044	-0.037
	(2.495)	(1.276)	(-1.269)
Overpay	-0.059***		
	(-6.098)		
Overpay (MV option)		0	
		(-0.105)	
Overpay (NS option)			-0.004**
			(-1.983)
ACP ratio	0.001***	0.001	0.001
	(3.675)	(1.199)	(1.155)
AREL	-0.018	-0.03	0.052**
	(-1.06)	(-1.083)	(1.987)
TCP ratio	0	0	0
	(-0.673)	(0.164)	(0.284)
TREL	0.009	0.013	0.025
	(0.48)	(0.348)	(0.829)

Rumor	-0.008	-0.003	-0.025
	(-0.8)	(-0.21)	(-1.644)
AROA	0.118***	0.052	-0.029
	(4.731)	(1.048)	(-0.523)
ASIZE	0.004***	0.006**	0.002
	(2.899)	(2.029)	(0.74)
ACAPITAL	0.028	0.119	0.137
	(0.521)	(1.169)	(1.563)
AMB	-0.001	0.002	0.001
	(-1.438)	(0.975)	(0.547)
TROA	0.018	0.025	0.284***
	(1.167)	(0.825)	(3.731)
TSIZE	-0.009***	-0.012***	-0.004
	(-5.327)	(-4.111)	(-1.353)
TCAPITAL	0.064	-0.126	-0.146
	(1.25)	(-1.312)	(-1.703)
TMB	0.002***	0	-0.004**
	(2.639)	(0.008)	(-2.353)
Year dummy	Yes	Yes	Yes
Adj.R square	0.159	0.134	0.154
F value	9.782	3.521	3.988
N	2044	617	757

4.2. Robust Test

Table 7 indicates that overpayment may negatively affect an acquiring firm's stock price. But what does overpayment mean in the context of market provision? Will such an error be perceived as a desperate mistake that will harm a firm's in the long run by impacting its stock price, or will the shock in value and price adjust itself in the following few days?

In order to test how long overpayment will affect stock price, and if religion will impact stock prices in different a period, we take CAR (0), CAR (−1, +1), CAR (−5, +5), CAR (−10, +10), CAR (−20, +20) and CAR (−30, +30) as dependent variables in table 8, respectively.

Table 8 indicates that Overpay has the most significant effect on CAR in the short-run (CAR (−1, +1)), obtaining a coefficient of −0.053 (−8.441) which is statistically significant at the 1% level. After stretching the period, we obtain the coefficients of CAR around −0.06 stably and expect the t value to gradually go down. This result indicates that overpayment will significantly affect stock prices one week after announcement. The descent of the t value when stretching the period implies that stock prices will be adjusted after investors consider the transaction comprehensively, though not only by the price. On the other hand, this table shows that the CAR is significantly positively relative to the ACP ratio. This means that investors place greater value in high CP ratio companies with respect to the execution of mergers because of some feature unique to them that is distinct from overpayment. In addition, we obtained a negative sufficient coefficient of TSIZE in each period of CAR. From this result, it is fair to assume that the market does not value acquiring firms that merge large companies.

Table 8. Robust Test of Premium in Different Periods

Table 8 presents the robust test of Premium in different periods. Dependent variables in column 1,2,3,4,5 and 6 are CAR (0), CAR (−1, +1), CAR (−5, +5), CAR (−10, +10), CAR (−20, +20) and CAR (−30, +30), respectively. Overpay is defined as offer price divided by target's stock price in announcement price. Overpay (MV option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's market value. Overpay (NS option) is defined as transaction value divided by estimated value calculated in real option method, using the growth rate of target's net income. ACP ratio (TCP ratio) is CP ratio of the area where acquirer (target) settle in. AREL (TREL) is Adherent ratio of the area where acquirer (target) settle in. Rumor is a dummy variable. It equal to 1 if Rumor exist before merger announced. Otherwise, it equal to 0. TR&D is defined as target's research and development expenditure divided by total assets in previous year of merger. AROA (TROA) is defined as acquirer's (target's) return on assets in previous year of merger. ASIZE (TSIZE) is defined as acquirer's (target's) LN (market capitalization) in previous year of merger. ACAPEX (TCAPEX) is defined as acquirer's (target's) capital expenditure divided by total assets in previous year of merger. AMB (TMB) is defined as acquirer's (target's) market value divided by book value in previous year of merger. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.025**	0.07***	0.056**	0.034	0.063	0.046
	(2.446)	(4.887)	(2.495)	(1.128)	(1.417)	(0.762)
Overpay	-0.018***	-0.053***	-0.059***	-0.058***	-0.064***	-0.063**
	(-3.989)	(-8.441)	(-6.098)	(-4.404)	(-3.244)	(-2.389)
ACP ratio	0	0.001**	0.001***	0.002***	0.003***	0.004***
	(1.361)	(2.023)	(3.675)	(3.307)	(3.482)	(3.375)
AREL	-0.004	-0.009	-0.018	-0.02	-0.057*	-0.117**
	(-0.501)	(-0.805)	(-1.06)	(-0.875)	(-1.662)	(-2.545)
TCP ratio	0	0	0	0.001	0.001	0.001
	(0.751)	(-0.053)	(-0.673)	(0.989)	(0.808)	(0.84)
TREL	-0.002	-0.002	0.009	0.006	-0.028	0.013
	(-0.181)	(-0.187)	(0.48)	(0.21)	(-0.704)	(0.247)
Rumor	0.004	0.008	-0.008	-0.015	-0.034*	-0.063**
	(0.852)	(1.35)	(-0.8)	(-1.129)	(-1.723)	(-2.381)
AROA	0.021*	0.056***	0.118***	0.118***	0.105**	0.108*
	(1.864)	(3.53)	(4.731)	(3.541)	(2.173)	(1.669)
ASIZE	0.001*	0.003***	0.004***	0.004**	0.003	0.005
	(1.882)	(3.039)	(2.899)	(2.23)	(0.907)	(1.258)
ACAPITAL	-0.012	-0.016	0.028	0.085	0.286***	0.419***
	(-0.48)	(-0.46)	(0.521)	(1.165)	(2.636)	(2.879)
AMB	0	-0.001**	-0.001	0.001	0.003**	0.008***
	(-0.181)	(-2.219)	(-1.438)	(0.996)	(1.999)	(3.695)
TROA	0.002	0.004	0.018	-0.014	-0.053*	-0.111***
	(0.272)	(0.411)	(1.167)	(-0.679)	(-1.7)	(-2.654)
TSIZE	-0.004***	-0.007***	-0.009***	-0.008***	-0.009***	-0.009**
	(-4.849)	(-6.75)	(-5.327)	(-3.443)	(-2.605)	(-2.015)
TCAPITAL	0.012	0.015	0.064	0.006	0.045	0.089
	(0.512)	(0.475)	(1.25)	(0.09)	(0.442)	(0.653)
TMB	0	0	0.002***	0.004***	0.009***	0.01***
	(1.058)	(-0.114)	(2.639)	(3.852)	(5.531)	(4.399)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Adj.R square	0.044	0.109	0.159	0.217	0.301	0.335
F value	3.136	6.665	9.782	13.882	21.067	24.462
N	2019	2029	2044	2044	2048	2045

5. Conclusion

Firm growth could be distinguished by internal and external factors. Internal development is a slow and low-risk activity that is suitable to young firms who have positive future development prospects. On the contrary, external development is a rapid and high-risk activity that is more suitable to mature firms who are struggling to expand their development potential. M&As are the product of external development. With that being said, how are we to be sure that the acquiring firm is accurately determining the price to be paid in a deal?

This study has examined M&A cases of American public companies over the past forty years. In accordance with past studies, we reveal that religion will affect a company's operating behaviors significantly. Our results indicate that companies with higher CP ratios prefer to invest more in speculative assets, like R&D and M&A. On the other hand, companies with higher religion ratios tend to invest more conservatively. We doubt that this tendency will impact the deal prices that they negotiate in a merger. Even high CP ratio companies demonstrate less risk aversion and tend to merge with other companies that also have a high MB ratio. Despite this, we have no evidence to prove that they are more likely to overpay, indicating that they will not invest irrationally. In this study, we have tried to present the real option method as a means of measuring the true price of a target firm. Taking tables 7 and 8 into account, we have shown that Overpay (offer price divided by target's stock price) carries with it a significant negatively association with Premium, consistent with past studies. But Overpay (calculated using the real option method) does not reveal any significant results. We thus consider the real option method to be inappropriate as a tool in the context of merger trading. Some restrictions and variables mentioned by Lukas and Welling (2012) would be too harsh to implement in practice. For example, it is not easy to collect sufficient information to measure transaction costs and excess value. A restriction of Lukas and Welling (2012) is that growth rates will never exceed risk-free rates. If they did, managers would prefer to postpone investments. In truth, however, the three-month T-bill rate has seldom exceeded 1%--or even 0.1%--in the past ten years. In cases in which this rate was to exceed such levels, companies with growth rates over 1% would be eliminated from our study given various restrictions. This would then trigger significant mistakes with respect to sample collection. As such, we believe that the real option method should not be used in mergers prior to undergoing improvements.

Funding: This research is partially sponsored by the Soft Science Research Project of Fujian Province, China (2019R0080)

References

1. Bénabou, R., Ticchi, D., and Vindigni, A. (2015). Moral values and economic behavior: Religion and Innovation, *American Economic Review*, 105(5), 346–351.
2. Ben-David, I., Graham, J. R., & Harvey, C. R. (2007). Managerial overconfidence and corporate policies, unpublished working paper, NBER.
3. Black, B. S. (1989). Bidder overpayment in takeovers. *Stanford Law Review,* 41(3), 65.
4. Brotherson, W. T., Eades, K. M., Harris, R. S., & Higgins, R. C. (2014). Company valuation in mergers and acquisitions: How is discounted cash flow applied by leading practitioners? *Journal of Applied Finance (Formerly Financial Practice and Education),* 24(2), 43-51.
5. Burgaud, F., Durand, J.-G., & Mavris, D. N. (2016). A risk-aversion-based project valuation method to determine optimal technology infusion and architecture in aircraft design, Paper presented at the 17th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference.
6. Callen, J.L., and Fang, X., (2015). Religion and stock price crash risk. *Journal of Financial and Quantitative Analysis*, 50(1-2), 69-195.
7. Campbell, C., Gallmeyer; M., Johnson, S., Rutherford, K., Stanley, B., (2011). CEO optimism and forced turnover. *Journal of Financial Economics,* 101, 695-712.
8. Capaldo, A., Cogman, D., and Suonio, H. (2009), What's different about M&A in this downturn?, *McKinsey on Finance*, 30, 31-36.
9. Chen, X., Harford, J., Li, K. (2007). Monitoring: Which institutions matter? *Journal of Financial Economics,* 86, 279-305.
10. Chen, Y., Podolski, E.J., Rhee, S.G., Veeraraghavan, M. (2014). Local gambling preferences and corporate innovative success. *Journal of Financial and Quantitative Analysis,* 49(1), 77-106.
11. Deloitte (2016), "Insurance M&A Outlook A year of continuing exuberance", www2.deloitte.com/content/dam/Deloitte/u

s/Documents/financial-services/us-fsi-2016-insurance-m-aoutlook.pdf.

12. Deshmukh, S., Goel, A.M., Howe, K.M., (2013). CEO Overconfidence and dividend policy. *Journal of Financial Intermediation,* 22(3), pp. 440-463.
13. Dikova, D., Sahib, P.R., 2013. Is cultural distance a bane or a boon for cross-border acquisition performance? *Journal of World Business,* 48(1), 77-86.
14. Ferris, K. and Petit, B. (2013), Valuation for mergers and acquisitions: an overview, Financial Times, www.ftpress.com/articles/article.aspx?p2109325&seqNum4
15. Ferris, S.P., Jayaraman, N., Sabherwal, S., (2013). CEO overconfidence and international merger and acquisition activity. *Journal of Financial and Quantitative Analysis,* 48(1), 137-164.
16. Fich, E. M., Rice, E. M., Tran, A. L. (2016), Contractual revisions in compensation: Evidence from merger bonuses to target CEOs, *Journal of Accounting and Economics*, 61, 338-368.
17. Fullerton, A. (2014), M&A: one question you don't want to be asking yourself at the closing table, *Mirus Capital Advisors*, http://merger.com/ma-question-dont/
18. Galasso, A., Simcoe, T.S., (2011). CEO overconfidence and innovation. *Management Science,* 57(8), 1469-1484.
19. Gao, Y., Oler, D., (2012). Rumors and pre-announcement trading: why sell target stocks before acquisition announcements? *Review of Quantitative Finance and Accounting,* 39, pp.485-508.
20. Gervais, S., & Odean, T. (2001). Learning to be overconfident. *Review of Financial Studies, 14*(1), 1-27.
21. Hartzell, J., Ofek, E., Yermack,D. (2004) What's in it for me? CEOs whose firms are acquired. *Review of Financial Studies*, 17, 37-61.
22. Hilary, G., Hui, K.W., (2009). Does religion matter in corporate decision making in America? *Journal of Financial Economics,* 93, 455-473.
23. Hirshleifer, D., Low, A., Teoh, S.H., (2012). Are overconfident CEOs better innovators? *Journal of Finance,* 67, 1457-1498.
24. Hribar, P., and Yang, H. (2015). CEO overconfidence and management forecasting. *Contemporary Accounting Research*, forthcoming.
25. Huang, J., & Kisgen, D. J. (2013). Gender and corporate finance: Are male executives overconfident relative to female executives? *Journal of Financial Economics, 108*(3), 822-839.
26. Jia, Y., (2013). Meeting or missing earnings benchmarks: the role of CEO integrity. *Journal of Business Finance & Accounting,* 40(3-4), 373-398.
27. Kumar, A., Page, J., Spalt, O., (2011). Religious beliefs, gambling attitudes, and financial market outcomes. *Journal of Financial Economics,* 102, 671-708.
28. Lukas, E., & Welling, A. (2012). Negotiating M&As under uncertainty: The influence of managerial flexibility on the first-mover advantage. *Finance Research Letters, 9*(1), 29-35.
29. Lyon, J., Barber, B., Tsui, C. (1999), Improved methods for tests of long-run abnormal stock returns, *Journal of Finance*, 54, 165-201
30. Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics, 89*(1), 20-43.
31. Malmendier, U., Tate, G., & Yan, J. (2011). Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies. *Journal of Finance,* 66(5), 1687-1733.
32. Malmendier, U., Tate, G., (2005). CEO overconfidence and corporate investment. *Journal of Finance,* 60(2), 2661-2700.
33. Mande, V., Son, M., (2012). CEO centrality and meeting or beating analysts' earnings forecasts. *Journal of Business Finance & Accounting* 39(1-2), 82-112.
34. Paola, M. D., Gioia, F., and Scoppa, V. (2014), Overconfidence, omens and gender heterogeneity: Results from a field experiment, *Journal of Economic Psychology*, 45, 237-252.
35. Pirinsky, C., Wang, Q., (2006). Does corporate headquarters location matter for stock returns? *Journal of Finance,* 61, 1991-2015.
36. Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of business*, 197-216.
37. Shu, T., Sulaeman, J., Yeung, P.E., (2012). Local religious beliefs and mutual fund risk-taking

behaviors. *Management Science,* 58, 1179-1796.

38. Stallworthy, W. A., Kharbanda, O. P., (1988). Takeovers, acquisitions and mergers: strategies for rescuing companies in distress. London: Kogan Page Limited.
39. Zivney, T.L., Bertin, W.J., Torabzadeh, K.M., (1996). Overreaction to takeover speculation. *Quarterly Review of Economics and Finance,* 36(1), 89-115.