CEO Overconfidence and International Merger and Acquisition Activity

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Abstract

This study examines the role that chief executive officer (CEO) overconfidence plays in an explanation of international mergers and acquisitions during the period 2000–2006. Using a sample of CEOs of *Fortune* Global 500 firms over our sample period, we find that CEO overconfidence is related to a number of critical aspects of international merger activity. Overconfidence helps to explain the number of offers made by a CEO, the frequencies of nondiversifying and diversifying acquisitions, and the use of cash to finance a merger deal. Although overconfidence is an international phenomenon, it is most extensively observed in individuals heading firms headquartered in Christian countries that encourage individualism while de-emphasizing long-term orientation in their national cultures.

I.   Introduction

Although the causes and performance of mergers have been extensively examined in the literature, few studies focus on the overconfidence of chief executive officers (CEOs) and managers as a factor in explaining merger activity.[1] Roll (1986) is the first to recognize the influence that individual CEO decision making might have on the decision to engage in merger activity with his hubris hypothesis. Roll argues that CEOs make relatively few mergers over their careers and hence are unable to learn from past errors. These CEOs are convinced that their valuation estimates of targets are correct.

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[1]Among the many empirical studies that examine mergers are Asquith, Bruner, and Mullins (1983), Jensen and Ruback (1983), Bradley, Desai, and Kim (1988), Franks, Harris, and Titman (1991), Agrawal, Jaffe, and Mandelker (1992), Loughran and Vijh (1997), Rau and Vermaelen (1998), Bruner (2002), Fuller, Netter, and Stegemoller (2002), and Bouwman, Fuller, and Nain (2009).

Doukas and Petmezas (2007) argue that managerial overconfidence results from a self-attribution bias. Specifically, overconfident CEOs feel that the have superior decision-making abilities and are more capable than their peers. The presence of these cognitive biases encourages CEOs to emphasize their own judgment in decision making and to engage in highly complex transactions such as diversifying acquisitions. Because of their overconfidence, these CEOs tend to underestimate the risks associated with a merger or overestimate the possible synergy gains from a business combination.

Malmendier and Tate (2008) examine the extent to which overconfidence can help to explain merger decisions and various characteristics of the deal itself. They find that overconfident CEOs are more likely to pursue acquisitions when their firms have abundant internal resources. They further report that overconfident CEOs are significantly more likely than other CEOs to undertake a diversifying merger. Finally, they observe that overconfident CEOs use cash to finance their mergers more often than other CEOs.

The literature, however, does not investigate the effect of this overconfidence on international merger and acquisition activity. Indeed, with the exception of Doukas and Petmezas (2007), existing studies only examine overconfidence in the context of U.S. mergers and ignore its international characteristics.[2] Because managerial overconfidence is shaped in part by national cultures, we expect that the dispersion of overconfidence among CEOs will vary across the globe.[3] As noted by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), (1999), (2000), Stulz and Williamson (2003), Doidge, Karolyi, and Stulz (2007), and Griffin, Lai, Yue, and Zhao (2009), national culture involves dimensions such as language, religion, and legal heritage. These factors can be expected to influence the extent to which overconfidence affects managerial decision making. Consequently, national cultures are likely to be important for an understanding of how overconfidence is related to global merger activity.

In this study, we ask two fundamental research questions concerning overconfidence and international merger activity. The 1st question focuses on whether country or country group patterns exist in the distribution of CEO overconfidence. Comparable legal systems and national cultures or shared standards of business practices might produce similarities in managerial decision making as we examine our sample of international mergers.

Our 2nd question investigates whether the results reported by Malmendier and Tate (2008) regarding U.S. mergers by overconfident managers hold internationally and focuses on how overconfident managers conduct their mergers. Do overconfident CEOs make more acquisition offers than their less confident counterparts? Do overconfident CEOs acquire targets that are more frequently outside of their firm's core business than other CEOs? Do overconfident CEOs finance

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[2]The study by Doukas and Petmezas (2007) does investigate overconfidence among U.K. executives. But the United Kingdom is another common law country, and the targets in their sample are limited to private companies.

[3]Graham, Harvey, and Puri (2009) find that important behavioral characteristics such as optimism and patience differ significantly between U.S. and non-U.S. executives. These traits are important determinants of corporate decision making and imply an important reason why overconfidence is likely to vary globally.

their acquisitions differently from other CEOs? Given significant international differences in the regulation of corporate merger activity and the availability of capital to support acquisitions, it is uncertain whether the results reported for the United States apply to the broader set of global mergers.

For a sample of mergers involving the *Fortune* Global 500 firms over the period 2000–2006, we document a number of demographic and country patterns in the global distribution of overconfident CEOs. We determine that overconfidence is most commonly observed in CEOs leading firms headquartered in Christian countries. We also find that the Hofstede (1980), (2001) measures of national culture help to explain geographical patterns in the dispersion of overconfident CEOs. Specifically, we discover that individualism positively influences the likelihood that a CEO will be overconfident. CEOs operating in countries whose cultures emphasize a long-term orientation tend to be less overconfident. We conclude that CEO overconfidence is an international phenomenon, although there are distinct patterns in its global distribution.

This study also shows that overconfidence is related to different aspects of merger activity. We find that overconfidence is an important factor in explaining the number of offers made by a CEO. This result is robust even after controlling for firm size, the availability of internal resources, the firm's investment opportunities, and total press mentions about the CEO. We confirm that overconfidence is a significant influence in the decision by CEOs to acquire an unrelated target, and this appears to be a global phenomenon. We also determine that overconfidence's role in selecting the deal's financing method is robust and holds for both U.S. and international mergers. Specifically, we find that overconfident CEOs prefer cash for acquiring a target because of their general belief that their firm's equity is undervalued.

We organize the remainder of this study into 6 sections. Section II describes our data collection and the method of sample construction. We also discuss our process for measuring overconfidence in this section. We present our findings regarding international patterns in CEO overconfidence in Section III. Section IV contains our analysis of the international determinants of overconfidence. The effect of overconfidence on the number of offers, type of merger, and the method of financing is discussed in Section V. In this section, we also examine possible bidirectionality in the relation between press characterizations and merger activity. In Section VI, we examine the extent to which country-level factors might influence the nature of merger and acquisition decisions by overconfident CEOs. Section VII provides a brief summary of our findings and a discussion of their importance to the literature.

II.   Data and the Measurement of Overconfidence

A.   Data and Sample Construction

Fortune magazine provides an annual ranking of the 500 largest companies in the world based on revenues. We begin our sample selection by compiling these lists during 2000–2006. We select all nonfinancial firms that appear at least once

in these lists. We exclude state-owned enterprises. We also identify the country in which our sample firm is headquartered.

For each firm in our data set, we include all of the firm's CEOs during 2000–2006. For the 2004–2006 sample period, the *Fortune* lists also include the name and gender of the CEO. During the years when a sample firm is not on the *Fortune* Global 500 list or is included during 2000–2003, when CEO information was not presented, the names of the CEOs are hand-collected. We also hand-collect the date of birth, birthplace, nationality, gender, education, and tenure with a firm for each CEO in our sample.

We search an identical set of databases for each CEO. These data sources consist of *Mergent Online*, the individual firm's Web site, the firm's financial statements, and 8 other Web sites.[4] We compute the age of a CEO as of 2006. We consider a CEO to have obtained a college education if he has completed an undergraduate degree. We classify a CEO as holding a graduate degree if he has a law degree, an MBA, or a PhD.

The legal regimes for countries are obtained from the classification reported in La Porta et al. (1998). Primary religions and languages of countries are drawn from Stulz and Williamson (2003). The dimensions of a country's culture are those created by Hofstede (1980), (2001). We consider a country to rank high (low) on a particular dimension of culture if it has a Hofstede (1980), (2001) score above (below) the median score for all the countries on that dimension.

We obtain accounting data from *Compustat Global* and *Compustat North America* databases. We measure the size of a firm as the log of assets at the beginning of the year. We measure Tobin's Q as the market value of assets over book value of assets at the beginning of the year and cash flow as earnings before extraordinary items plus depreciation normalized by capital at the beginning of the year.

We convert accounting data other than ratios to US$ using exchange rates obtained from the *Compustat Global* database. Items measured at a specific time, such as assets, are converted from local currency to US$ based on the exchange rate at that time. Items measured over a year, such as sales, are converted to US$ based on the 12-month average exchange rate over that year.

We use the Securities Data Company merger database to obtain announcement dates and merger financing information for completed deals by our sample firms. Following Malmendier and Tate (2008), we require that the acquiring firm obtain a control (at least 51%) of the target shares and omit acquisitions in which the acquirer already holds at least 51% of the target before the deal. Furthermore, following Morck, Shleifer, and Vishny (1990), we omit acquisitions worth less than 5% of acquirer value. As in Malmendier and Tate (2008), we consider an acquisition as related if the target and the acquirer share the same Fama-French (1997) 48 industry group. We differentiate offers based on financing used (offers in which only cash is used to finance the acquisition versus other offers in which some debt or equity is used).

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[4]We use a variety of Web sites to obtain the biographical data for our sample. Included among these are http://people.forbes.com, http://www.chinavitae.com/biography, and http://global.factiva.com

B.   Measuring Overconfidence

Malmendier and Tate (2008) use the propensity of managers of the acquiring firms to hold in-the-money equity options as their primary measure of managerial overconfidence. Unfortunately, such option holding data are not available for international CEOs. Thus, a comparable measure of overconfidence cannot be constructed for our sample. But Malmendier and Tate (2005) also estimate an overconfidence measure based on press releases that we can calculate for our set of global firms. That is, the descriptions of CEOs as contained in public news articles can be used to measure their overconfidence. Malmendier and Tate (2005) observe that this proxy provides direct insight into the type of person classified as overconfident, and its strength is its ability to measure CEO beliefs as assessed by outsiders.

To construct this press-based measure of overconfidence, we use global news sources contained in the Factiva database. Thus, we limit our analysis to global wires (i.e., *Dow Jones*, *PR*, and *Reuters*) and global business publications (i.e., *The Wall Street Journal* (North American, European, and Asian editions), *Financial Times,* and the *Economist*). Our use of only global news sources helps to eliminate any bias in the nature and extent of coverage that might occur with local media.

For each CEO of a firm, we record the number of articles related to the firm in *Factiva* during 2000–2006 that refer to the CEO using the terms (a) "confident" or "confidence," (b) "optimistic" or "optimism," (c) "not confident," (d) "not optimistic," or (e) "reliable," "cautious," "conservative," "practical," "frugal," or "steady." We then compare the number of articles that portray a CEO as confident and optimistic to the number of articles that portray him as not confident, not optimistic, reliable, cautious, conservative, practical, frugal, or steady. That is, we classify a CEO as overconfident if $a + b > c + d + e$. We do not classify a CEO with respect to overconfidence if we fail to find any articles that mention the CEO.

III.   International Patterns in CEO Overconfidence

In this section, we explore the nature of CEO overconfidence and how it varies internationally. Previous studies such as Malmendier and Tate (2005), (2008) and Campbell, Gallmeyer, Johnson, Rutherford, and Stanley (2011) examine overconfidence only among the CEOs of U.S. firms. Thus, they are unable to investigate how overconfidence differs across various national cultures. Yet Stulz and Williamson (2003) show that national culture, as proxied by religion and language, influences the level of protection available to investors and, by implication, the extent to which a CEO can exert influence and power. Earlier studies such as Miller and Hoffman (1995), Diaz (2000), Halek and Eisenhauer (2001), and Osoba (2003) report an inverse relation between religiosity and individual risk tolerance. Hilary and Hui (2009) confirm this result and find that firms located in U.S. counties with high levels of religious participation have lower rates of investment in both tangible and intangible assets. These findings suggest that differences in national cultures can exert important influences on individual

behavior. Consequently, national culture has the potential to affect the global distribution of overconfidence and how such overconfidence might be exhibited in corporate behaviors.

A.   Sample and Data Characteristics

In a set of panels presented in Table 1, we discuss the characteristics of our data. In Panel A, we present the demographic profile of our sample CEOs. We observe that 82% of them are between the ages of 50 and 69. Approximately an equal number of individuals are in their 50s and 60s. About 98% of our sample CEOs are male, and almost all hold at least a bachelor's degree. Nearly 64% of our sample has earned a graduate degree. Almost one-half (49.7%) of the sample is born in the United States, followed by Japan (7.5%), France (6.4%), United Kingdom (5.6%), and Germany (4.8%). Only about 3.4% of our sample CEOs are born in Africa, South America, or Australia. The birthplace of our sample CEOs approximately aligns with the distribution of firm locations. About 49% of our CEOs lead U.S. firms, followed in frequency by Japan (13.2%), United Kingdom (6.7%), France (5.8%), and Germany (3.9%).

In Panel B of Table 1, we provide summary financial characteristics for our sample firms. Given that our firms are drawn from the *Fortune* Global 500 list, it is not surprising that they are large, with an average asset value in excess of $31 billion and a market equity capitalization of $34 billion. Our sample firms appear profitable, with a mean operating return on assets of 14% and a cash flow to property, plant, and equipment (PPE) ratio of 0.51. Earnings for these sample firms are $1.1 billion on average sales of $27.6 billion. These firms are not highly leveraged, with a debt-to-total-assets ratio of only 29%. These firms appear to have valuable growth opportunities, with an average Q ratio of 1.96.

We present select statistics regarding the nature of the global press coverage of our sample CEOs in Panel C of Table 1. We observe that CEOs have a mean (median) number of total press mentions of 349 (162) over our sample period. Only a small number of these releases, however, comment on the confidence of the CEO. CEOs have a mean (median) of 10 (4) articles that describe them as confident and only about 3.6 (1) articles that suggest that they are not confident.

Panel D of Table 1 contains an industry distribution of overconfident CEOs as per the industry classification in Malmendier and Tate (2008). We find that the highest percentage of overconfident CEOs occurs in the service industry, which corresponds to Standard Industrial Classification (SIC) codes 7000–8710, 8712–8720, and 8722–8999. About 78% of the CEOs in this industry group are overconfident. This is followed by the technical industry (SIC codes: 1000–1799, 8711), with 65.5% of their CEOs being overconfident. Industries classified as trade in SIC codes 5000–5999 appear to have the lowest percentage of overconfident CEOs. All of these industry percentages, except for that of the trade industry, are significantly different from 50%.[5]

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[5]Our estimate that 62% of our sample CEOs are overconfident is comparable to that of Malmendier and Tate (2005) Holder67 and Net Buyer values (51.3% and 61.3%, respectively), while Hirshleifer, Low, and Teoh (2012) report a Net Buyer value of 61.4%. Differences in the sample period, size, and

TABLE 1

Data Characteristics and Distribution

In Table 1, firms are drawn from the *Fortune* Global 500 lists that appear during 2000–2006. Corresponding data years are 1999–2005. In Panel B, the numbers are based on all firm-year observations. All values other than ratios are in millions of US$. Items measured at a point in time, such as assets, are converted from local currency to US$ based on the exchange rate at that time. Items measured over a year, such as sales, are converted from local currency to US$ based on the 12-month average exchange rate over that year. Earnings refer to earnings before extraordinary items. The z-statistics in Panel D are 2-tailed for the test that the proportion of overconfident CEOs is $1/2$. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

Panel A. CEO Demographics

Item	Number	Percent
Age	636	100.00
30–39	1	0.16
40–49	59	9.28
50–59	236	37.11
60–69	285	44.81
70–79	51	8.02
80 and above	4	0.63
Gender	660	100.00
Male	647	98.03
Female	13	1.97
Education	566	100.00
No / some college	8	1.41
Bachelor	197	34.81
Master	242	42.76
PhD	67	11.84
Law degree	52	9.19
Birthplace	626	100.00
Africa	7	1.12
Japan	47	7.51
Asia excluding Japan	48	7.67
Australia	7	1.12
France	40	6.39
Germany	30	4.79
United Kingdom	35	5.59
Rest of Europe	76	12.14
United States	311	49.68
N. America excluding United States	18	2.88
South America	7	1.12
Firm Location	660	100.00
Africa	0	0.00
Japan	87	13.18
Asia excluding Japan	41	6.21
Australia	8	1.21
France	38	5.76
Germany	26	3.94
United Kingdom	44	6.67
Rest of Europe	74	11.21
United States	323	48.94
N. America excluding United States	17	2.58
South America	2	0.30

nationality of our sample firms are likely to explain whatever variances exist between our estimate of overconfident CEOs and those in the above studies. Malmendier and Tate (2008) examine overconfidence between 1980 and 1994, which provides no overlap with our study. Hirshleifer et al. study the years between 1993 and 2003, providing only a partial overlap of 4 years. Our sample consists of much larger firms than those studied by either Malmendier and Tate (2005), (2008) or Hirshleifer et al. (2012). Malmendier and Tate (2008) examine firms whose average total assets are less than $6 billion, compared to our set of international firms, whose mean size is over 5 times as large, at a value of $31.6 billion. Our sample also differs significantly from that of Hirshleifer et al. in terms of size. The mean level of sales for our sample firms is $27.6 billion, compared to only $4.0 billion for firms in the Hirshleifer et al. sample. The importance of the size difference across samples is relevant, since previous work shows that firm size is an important determinant of CEO salary (Gabaix and Landier (2008)). Researchers such as Hayward and Hambrick (1997), Paredes (2005), and others further demonstrate that CEO salary is an important determinant of subsequent CEO overconfidence.

TABLE 1 (continued)

Data Characteristics and Distribution

Panel B. Firm Financial Characteristics

Characteristic	No. of Obs.	25th Percentile	Median	75th Percentile	Average
Assets	2,677	10,264.90	18,293.90	34,348.39	31,625.32
Market value of equity	2,598	4,957.99	11,414.44	28,781.01	34,444.00
Capital (PPE)	2,677	2,524.40	5,886.22	12,392.01	10,792.30
Investment (CAPX)	2,671	429.97	920.00	1,947.00	1,873.59
Sales	2,705	11,708.80	17,197.51	30,082.53	27,581.58
Earnings	2,705	195.48	596.91	1,480.49	1,132.78
Operating income	2,702	1,147.38	2,209.31	4,539.44	4,016.13
Operating income/Assets	2,674	0.08	0.13	0.18	0.14
Debt/Assets	2,676	0.17	0.27	0.39	0.29
Cash flow	2,700	688.17	1,422.98	3,144.00	2,719.18
Cash flow/PPE	2,671	0.16	0.27	0.50	0.51
Cash flow/Assets	2,672	0.05	0.08	0.13	0.10
Q	2,598	1.09	1.29	1.81	1.96

Panel C. Global Press Mentions Indicating Overconfidence

Item	Mean	Median	Std. Dev.
All mentions	349.36	162.00	627.62
Confident/optimistic mentions	10.36	4.00	19.52
Mentions indicating not confident	3.63	1.00	9.34

Panel D. Industry Distribution

Industry	Total	OC CEOs	% OC	z-Statistic
All	660	409	61.97	6.15***
Manufacturing industry	325	202	62.15	4.38***
Service industry	41	32	78.05	3.59***
Technical industry	29	19	65.52	1.67*
Trade industry	129	71	55.04	1.14
Transportation industry	136	85	62.50	2.92***

B.   Overconfidence and CEO Characteristics

In this section, we examine the extent to which overconfidence varies with various CEO characteristics. We undertake this analysis through the construction of a correlation matrix between select CEO attributes and our measure of overconfidence. In Table 2, we observe a number of interesting and significant correlations. We find that overconfidence is inversely related to age, suggesting that older CEOs are more cautious. This result is also consistent with the findings of Levi, Li, and Zhang (2009), who report that young CEOs represent more of a dominance challenge to their counterparts, resulting in a greater incidence of bid withdrawals and tender offers by younger CEOs. CEOs of firms located in common law countries are also more overconfident. We also determine that CEOs leading firms headquartered in countries whose primary religion is Christianity or where the national language is English tend to be more overconfident.

We also introduce the Hofstede (1980), (2001) measures of national culture into the correlation analysis of Table 2. These measures are used in a number of accounting and finance studies such as Hope (2003), Beugelsdijk and Frijns (2010),

TABLE 2

Correlation Matrix between Overconfidence, CEO Demographics, Country Characteristics, and Cultural Dimensions

In Table 2, the number of observations ranges from 535 to 660. *Age* is as of 2006. *College* is a binary variable that takes a value of 1 if the CEO has completed a college degree (undergraduate degree or higher). *Graduate* is a binary variable that takes a value of 1 if the CEO has completed a graduate college degree (Law, MBA, PhD). So, if *Graduate* is 1, *College* is 1 as well. *Male, Common Law, Christianity*, and *English* are binary indicator variables assuming a value of 1 if the variable is male (Common Law, Christian, or English), and 0 otherwise. Variables related to Hofstede's (1980), (2001) measures are binary variables. They take a value of 1 if the country in which the firm is headquartered has a score above the world median. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

Characteristic	Over-confidence	Age	Male	College	Graduate	Common Law	Christianity	English	Power Distance	Uncertainty Avoidance	Individualism	Masculinity
Age	−0.156***											
Male	0.001	0.132***										
College	−0.025	−0.027	−0.016									
Graduate	0.016	−0.058	0.001	0.159***								
Common law	0.109***	−0.163***	−0.045	−0.056	−0.015							
Christianity	0.274***	−0.288***	−0.004	−0.043	0.051	0.452***						
English	0.121***	−0.148***	−0.051	−0.059	−0.022	0.960***	0.538***					
Power distance	−0.045	−0.125***	0.028	0.049	−0.005	−0.409***	−0.069	−0.502***				
Uncertainty avoidance	−0.192***	0.220***	0.012	0.065	−0.038	−0.759***	−0.548***	−0.728***	0.471***			
Individualism	0.159***	0.047	−0.031	−0.027	−0.015	0.215***	0.021	0.264***	−0.526***	−0.261***		
Masculinity	0.015	0.102**	−0.040	−0.055	−0.011	0.495***	0.016	0.574***	−0.797***	−0.337***	0.398***	
Long-term orientation	−0.320***	0.267***	0.015	0.050	−0.066	−0.536***	−0.886***	−0.598***	0.249***	0.657***	−0.382***	−0.168***

and Chui, Titman, and Wei (2010) since their creation by Hofstede in 1980. These measures consist of 5 different dimensions of a country's culture. The power distance index captures the extent to which less powerful members of organizations and institutions within a country both accept and expect that power is distributed unequally. Individualism measures the extent to which individuals are integrated into groups within a country. Masculinity refers to the distribution of roles between genders. Uncertainty avoidance addresses a society's tolerance for uncertainty and ambiguity. It indicates the extent to which that country's culture programs its members to feel comfortable or not in unstructured situations. The last of the Hofstede (1980), (2001) dimensions is long-term orientation and focuses on the relative importance of thrift, perseverance, tradition, and satisfaction of social obligations. We more fully describe these Hofstede (1980), (2001) cultural dimensions in the Appendix.

We find that power distance, uncertainty avoidance, and long-term orientation are inversely related to overconfidence, but only the latter two are statistically significant. Not surprisingly, individualism and masculinity are positively correlated with overconfidence. The correlation coefficient for masculinity, however, is statistically insignificant.

C. Global Distribution of CEO Overconfidence

Nationality is traditionally based on the country of the CEO's birth. Alternatively, nationality can be defined from an "assimilated" perspective based on the country in which the firm is headquartered. This definition argues that the attributes and perspectives associated with a nationally can be assimilated through exposure and living experiences with a given nationality. It reflects the idea that a CEO's cultural beliefs, behaviors, and perspectives will be determined by those of the country in which his firm is headquartered and consequently where he spends the majority of professional time. We find a high correlation in all of our findings between the traditional and assimilation measures of nationality, with no meaningful difference in interpretations between the two. We elect to report the results in this study only for the assimilated measure of nationality.

We now more closely examine the nature of CEO overconfidence as it is exhibited globally. In Panel A of Table 3, we find the highest percentage of overconfident CEOs to be in Australia (100%), followed by Germany (88.5%). But the number of sample firms in Australia is small; therefore, we can infer relatively little from this result. After Germany, two other Western European countries have a high percentage of overconfident CEOs: France, at 84.2%, and the United Kingdom, at 81.8%. Over 71% of the remaining European CEOs are classified as overconfident, which exceeds the 63.5% estimated for U.S. CEOs. The lowest percentage of overconfident CEOs occurs in Japan, with 29.9%, followed by the rest of Asia at 31.7%.

Given work by Stulz and Williamson (2003), Griffin et al. (2009), and Hilary and Hui (2009) on the impact of national cultural attributes on corporate decision making, we examine how national legal regime, primary religion, and official language might influence a CEO's overconfidence. In Panel B of Table 3, we find that CEOs tend to be overconfident regardless of legal regime, although there is a

TABLE 3

International Patterns of Overconfidence

In Table 3, OC refers to overconfident, and z-statistics are 2-tailed for the test that the proportion of OC CEOs is $\frac{1}{2}$. In Panel C, a CEO of a firm is included in the high (low) group if the country of the firm's headquarters has a Hofstede (1980), (2001) score above (below) the world median score for that measure. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Overconfidence by CEO Nationality

Firm Location	Total	OC CEOs	% OC	z-Statistic
All	660	409	62.0	6.17***
Japan	87	26	29.9	−3.75***
Asia excluding Japan	41	13	31.7	−2.34**
Australia	8	8	100.0	2.83***
France	38	32	84.2	4.22***
Germany	26	23	88.5	3.93***
United Kingdom	44	36	81.8	4.22***
Rest of Europe	74	53	71.6	3.72***
United States	323	205	63.5	4.85***
Canada	16	12	75.0	2.00**
Brazil and Mexico	3	1	33.3	−0.58

Panel B. Overconfidence by Legal Origin, Religion, and Language

Dimension	Total	OC CEOs	% OC	z-Statistic
Legal Origin				
Civil law	255	141	55.3	1.69*
Common law	405	268	66.2	6.52***
Religion				
Buddhist	100	30	30.0	−4.00***
Catholic	113	87	77.0	5.74***
Christianity-other	2	1	50.0	0.00
Hindu	9	5	55.6	0.34
Protestant	436	286	65.6	6.51***
Language				
Chinese	11	4	36.4	−0.90
Dutch	19	16	84.2	2.98***
English	392	262	66.8	6.65***
Finnish	5	4	80.0	1.34
French	38	32	84.2	4.22***
German	38	33	86.8	4.54***
Hindi	9	5	55.6	0.34
Italian	14	10	71.4	1.60
Japanese	87	26	29.9	−3.75***
Korean	19	4	21.1	−2.52**
Norwegian	4	3	75.0	1.00
Portuguese	2	1	50.0	0.00
Russian	2	1	50.0	0.00
Spanish	11	5	45.5	−0.30
Swedish	7	3	42.9	−0.38
Thai	2	0	0.0	−1.41

Panel C. Overconfidence by Hofstede's Cultural Dimensions

Hofstede's Measure	Total	OC CEOs	% OC	z-Statistic
Power Distance				
Low	563	352	62.5	5.93***
High	97	55	56.7	1.32
z-statistic to compare % OC			1.09	
Uncertainty Avoidance				
Low	482	326	67.6	7.73***
High	178	83	46.6	−0.91
z-statistic to compare % OC			4.93***	
Individualism				
Low	30	8	26.7	−2.55**
High	630	401	63.7	6.88***
z-statistic to compare % OC			−4.08***	
Masculinity				
Low	124	75	60.5	2.34**
High	536	334	62.3	5.70***
z-statistic to compare % OC			−0.37	
Long-Term Orientation				
Low	528	368	69.7	9.05***
High	128	39	30.5	−4.41***
z-statistic to compare % OC			8.20***	

suggestion that CEOs of firms located in common law countries tend to be more overconfident than their civil law counterparts.

In the 2nd section of Panel B in Table 3, we examine the influence of the major religion of the country in which the firm is headquartered. We find that CEO overconfidence varies across national religions. CEOs of firms headquartered in Catholic and Protestant countries are significantly more overconfident than their counterparts who lead companies headquartered in nations with Buddhism as the major religion.

The final section of Panel B in Table 3 examines the influence of a country's primary language on CEO overconfidence. We observe that overconfident CEOs are significantly more frequent in countries whose primary language is English, Dutch, French, or German. Interestingly, the use of Korean or Japanese as the primary language is negatively related to the percentage of CEOs classified as overconfident. This result is consistent with the results in Panel A containing the geographical distribution of overconfidence. Due to small sample sizes, the other languages are not significantly related to a high percentage of overconfident CEOs.

We examine the ability of national culture to influence CEO overconfidence in another way by analyzing the Hofstede (1980), (2001) cultural dimensions in Panel C of Table 3. We observe a high percentage of overconfident CEOs regardless of a country's power distance or masculinity. We do find, however, that there are significant differences in the percentage of overconfident CEOs when we consider a country's preference for uncertainty avoidance, individualism, and long-term orientation. Countries that have a low preference for uncertainty avoidance have cultures that are more accepting of change and capable of taking on more risk. We find that firms headquartered in such countries are more frequently led by overconfident CEOs. It might be that such individuals are more capable of responding to the rapid changes and dynamism of these cultures.

We further find that CEOs of firms headquartered in countries with a high level of individualism are significantly more overconfident than those in low-individualism countries. This is consistent with individualism's focus on individual freedom and personal challenge. As noted by Griffin et al. (2009), cultures with a high degree of individualism emphasize independent action while encouraging individual freedom and personal choice.

Finally, we observe that CEOs are more overconfident when they lead firms headquartered in countries characterized by a low level of long-term orientation. Such cultures are capable of more rapid change, and long-term traditions are less of a barrier to innovation. Consequently, firms might believe that an overconfident CEO with the ability to make quick decisions and remain committed provides the best leadership in such an environment.

We conclude from Table 3 that there are significant differences in the national origin of overconfident CEOs. Most typically, overconfident CEOs originate from Europe and North America. Countries on these continents have English or other European languages as their official language and are Christian in their religious heritage. Overconfident CEOs are also more likely to be found in firms headquartered in countries with a high level of individualism, a low level of uncertainty avoidance, and a short-term orientation.

IV.   International Determinants of Overconfidence

A number of factors can contribute to the presence of overconfidence in a CEO. In this section, we examine the influence of these factors on CEO overconfidence in a multivariate framework. In Table 4, we present the results from logistics regressions of overconfidence against independent variables drawn from a variety of demographic, national, cultural, and institutional variables. We use standard errors clustered by country in these regressions. We also control for the total number of articles that mention a particular CEO in an effort to eliminate any classification bias resulting from differences in press coverage. We find that the total mentions variable is significant across all model specifications, indicating the importance of the level of press activity in shaping CEO overconfidence.

TABLE 4

Logistic Regressions of Overconfidence by CEO Demographics, Country Characteristics, and Cultural Dimensions

In Table 4, the dependent variable is CEO overconfidence. *Age* is as of 2006. *College* is a binary variable that takes a value of 1 if the CEO has completed a college degree. *Male, Common, Christianity,* and *English* are binary variables assuming a value of 1 if the variable is male (common, Christian, or English). The 5 variables related to culture are binary variables. They take a value of 1 if the country of the firm location has a Hofstede (1980), (2001) score above the world median. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

	Model				
					Non-U.S.
Independent Variable	1	2	3	4	5
No. of obs.	535	660	656	656	333
CEO Demographics					
Age	−0.02				
	(−1.21)				
Male	0.24				
	(0.39)				
College	−0.60				
	(−0.68)				
Firm Demographics					
Common		0.40			
		(0.75)			
Christianity		0.96***		−0.03	0.06
		(2.66)		(−0.07)	(0.16)
English		−0.24			
		(−0.38)			
Cultural Dimensions					
Power distance			0.70		
			(1.50)		
Uncertainty avoidance			−0.14		
			(−0.63)		
Individualism			1.00**	0.61	0.63
			(2.41)	(1.27)	(1.39)
Masculinity			0.25		
			(0.63)		
Long-term orientation			−0.99***	−1.07***	−1.23***
			(−4.23)	(−2.70)	(−3.28)
Total mentions	0.42***	0.45***	0.52***	0.53***	0.43***
	(3.52)	(3.80)	(6.68)	(6.56)	(4.46)
Intercept	1.17	−1.39***	−1.62***	−0.94	−0.70
	(0.82)	(−11.61)	(−2.79)	(−1.11)	(−0.88)

In Model 1 of Table 4, we examine the explanatory power of various CEO demographic characteristics. Barber and Odean (2001) report evidence of greater

overconfidence among male stock traders, and we find that being male is positively associated with CEO overconfidence, although the coefficient is statistically insignificant. We determine that both age and status as a college graduate are inversely related to overconfidence, but neither is statistically significant.[6] The uniform statistical insignificance of these demographic variables suggests that CEO overconfidence is shaped by factors other than the personal characteristics of the individual.

Model 2 of Table 4 examines the role that various country characteristics exert on the likelihood of CEO overconfidence. We observe that both a common law legal heritage and Christianity as the primary religion positively influence the likelihood that a CEO will be overconfident. But only Christianity as the major religion is statistically significant. The use of English as the official language has no significant effect on the probability that a CEO is overconfident.

The influence of Hofstede's (1980), (2001) 5 cultural dimensions is examined with Model 3. We find that power distance, masculinity, and individualism positively influence the likelihood that a CEO will be overconfident. Individualism is statistically significant, while masculinity and power distance are not. Uncertainty avoidance and long-term orientation are inversely related to CEO overconfidence, but only long-term orientation is statistically significant. CEOs operating in countries whose cultures emphasize a long-term orientation and thus are more constrained by traditions tend to have less overconfident CEOs.

In Models 4 and 5 of Table 4, we estimate combined specifications, using the significant variables identified in the previous 3 models. We find in Model 4 that only long-term orientation is statistically significant when we simultaneously consider CEO demographic, country characteristic, and cultural dimension variables. Model 5 is estimated using all of the independent variables, but restricted to non-U.S. firms. We find virtually identical results to those obtained for Model 4. We conclude that the effect of long-term orientation on CEO overconfidence is not simply a U.S. phenomenon, but applies globally.

V.   The Nature of International Merger Activity

In this section, we explore the extent to which overconfident CEOs can influence a number of important dimensions of international merger activity. Specifically, we examine the extent to which the findings of Malmendier and Tate (2008) concerning the number of merger offers, the incidence of diversifying versus related mergers, and the method of deal financing by overconfident CEOs hold for non-U.S. firms.

A.   Number of Merger Offers

In Table 5, we provide a multivariate analysis of the relation between overconfidence and the number of merger offers made by a CEO. We estimate Poisson regressions, since the dependent variable is measured as a count. We regress the

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[6]Graham et al. (2009) imply an explanation for the inverse relation between overconfidence and a college degree, noting that it might indicate conservatism, as those impatient with their ambition might decide that higher education, especially a graduate degree, is not necessary.

TABLE 5

Poisson Regressions of the Number of Offers per CEO

In Table 5, Poisson regressions are estimated, since the dependent variable is a count of the number of offers made per CEO. *Size* is measured as the log of assets. *Q* is the market value of assets over book value of assets. *Cash flow* is earnings before extraordinary items plus depreciation, normalized by capital. *US dummy* is a binary variable with a value of 1 for CEOs of American firms. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. Models 1–3 are estimated for the entire sample and Model 4 is estimated for non-U.S. firms only. In Panel B, the number of offers in 2004–2006 is regressed against overconfidence estimated during 2000–2003. *Prior offers* is the number of offers during 2000–2003. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

	Model			
				Non-U.S.
Independent Variable	1	2	3	4
Panel A. Overconfidence Estimated during 2000–2006				
No. of obs.	660	660	660	337
Overconfidence	0.55***	0.39***	0.37***	0.47***
	(4.17)	(3.39)	(3.36)	(2.61)
Size		0.48***	0.50***	0.24*
		(3.42)	(3.94)	(1.92)
Q		0.01	0.01	0.00
		(1.06)	(1.17)	(1.31)
Cash flow		0.12***	0.11***	0.35*
		(3.06)	(2.95)	(1.68)
US dummy			0.39**	
			(2.38)	
Total mentions	0.03***	0.02***	0.02***	0.03***
	(4.58)	(4.84)	(4.37)	(3.02)
Intercept	0.74***	−4.04***	−4.45***	−2.00
	(7.99)	(−2.87)	(−3.34)	(−1.52)
Panel B. Overconfidence Estimated during 2000–2003				
No. of obs.	623	623	623	317
Overconfidence	0.57***	0.52***	0.52***	0.71***
	(3.80)	(3.47)	(3.43)	(3.03)
Size		0.17*	0.17*	0.21*
		(1.76)	(1.72)	(1.70)
Q		0.02**	0.02**	0.01***
		(2.22)	(2.21)	(3.40)
Cash flow		0.07	0.07	0.48**
		(1.48)	(1.48)	(2.37)
US dummy			0.01	
			(0.07)	
Total mentions	0.01	0.01	0.01	−0.01**
	(0.56)	(0.31)	(0.31)	(−2.42)
Prior offers	0.06***	0.05***	0.05***	0.11***
	(14.30)	(7.89)	(7.45)	(7.11)
Intercept	−0.33***	−2.08**	−2.10**	−2.80**
	(−2.89)	(−2.16)	(−2.07)	(−2.19)

number of merger offers per CEO against CEO overconfidence and a set of control variables. We include the logarithm of assets as a control for firm size, while the market-to-book ratio of asset value is a control for the firm's investment opportunities. Cash flow is a measure of internal resources available to the CEO to finance the acquisition. We also include a binary indicator variable to control for status as a U.S. firm or otherwise. Again, the number of total press mentions is included as a control variable in all of the models. Following Petersen (2009), we use standard errors clustered by firm in all our regressions related to merger activity.

Panel A of Table 5 contains our multivariate estimates for 4 different model specifications. In Model 1, we estimate the regression between the number of offers and an indicator variable for CEO overconfidence. We obtain a statistically significant coefficient for overconfidence, indicating that these CEOs tend to extend more offers than nonoverconfident CEOs. In Model 2, we introduce all control variables except the U.S. indicator variable, since this specification tests the aggregate sample without consideration of the location of a firm's headquarters. Again, we find that overconfidence is positively and significantly related to the number of merger offers made by a CEO. We also find that firm size and cash flow are significantly positive influences on the offer behavior of CEOs. The firm's investment opportunities, proxied by Q, is also positive but statistically insignificant. In Model 3, we introduce the U.S. indicator variable. We obtain statistical significance for overconfidence as well as firm size, cash flow, and the U.S. indicator variable. We eliminate all U.S. firms from the estimation of Model 4. We continue to observe that overconfidence is statistically significant. The other independent variables in Model 4 are generally statistically significant.

We conclude from Panel A of Table 5 that overconfidence is an important factor in explaining the number of offers made by a CEO. This result is robust to controlling for firm size, the availability of internal resources, total number of press mentions, and the firm's investment opportunities. Of even greater interest is our finding that this result is not limited to U.S. firms but is an international phenomenon.

It is possible that the press writes more frequently about CEOs and firms that conduct mergers. Likewise, reporters might infer confidence or optimism from dramatic decisions made by a CEO such as a merger or an acquisition. To more fully test our hypothesis that it is CEO overconfidence that affects merger activity, we reestimate our measure of CEO overconfidence using press characterizations that predate any merger activity.

We construct this new overconfidence measure by dividing our sample into 2 subperiods. The 1st subperiod extends from 2000 through 2003. Over this subperiod, we use the corresponding press releases to classify the sample CEOs as either overconfident or not. We then use this measure for our examination of merger and acquisition activity during the 2nd subperiod (2004–2006). Because a strategy of serial acquisitions by a sample firm represents yet another channel for reverse causality, we also control for the number of offers made during the 2000–2003 subperiod in our regression analyses.

In Panel B of Table 5, we examine the number of merger offers made by overconfident CEOs using this new approach. We estimate 4 different model specifications, including one using only our sample of non-U.S. firms. We find that the coefficient for overconfidence is uniformly significant and positive across all models. These results suggest that the influence of overconfidence on the number of merger offers made is a robust effect.

B.   Type of Acquisition

Overconfidence among CEOs can also manifest itself in the type of deal that they elect to undertake. More specifically, mergers that are diversifying in nature

are generally considered to be more uncertain and are often met with negative announcement period returns (Morck et al. (1990)). Because overconfident CEOs are more likely to overestimate their ability to create value from a merger, they might be more likely to pursue acquisitions beyond their firm's core business. Consequently, in this section, we examine the extent to which overconfident CEOs engage in diversifying mergers relative to their less confident peers. Consistent with Malmendier and Tate (2008), we define a diversifying merger as one where the acquirer and target do not share the same Fama-French (1997) 48 industry group assignment.

In Table 6, we introduce CEO overconfidence as an independent variable in a set of Poisson regressions examining the number of nondiversifying and diversifying offers. Panel A contains our findings for the aggregate sample, using the same control variables as in Table 5. We estimate 3 models for nondiversifying offers and the same 3 specifications for diversifying offers. Our analysis of the number of nondiversifying offers made per CEO is contained in the 3 leftmost columns of Panel A. Model 1 is calculated for the aggregate set of firms, and we find that overconfidence is significantly positive. The remaining regressors are likewise positive and, except for Q, statistically significant. Model 2 also examines all firms, but it makes use of a binary variable to control for classification as a U.S. firm. We find that overconfidence as well as all of the independent variables are significantly positive. Model 3 is limited to only non-U.S. firms, and we continue to observe that overconfidence is statistically significant and positive. Also, Q is positive and statistically significant. The results from these 3 models provide robust evidence that CEO overconfidence is an important influence in the decision of firms to acquire nondiversifying targets and is a global phenomenon.

Our analysis of diversifying mergers is provided in the 3 rightmost columns of Panel A in Table 6. Model 1 contains all sample firms and shows that overconfidence is a significant factor for understanding the corporate pursuit of unrelated targets. Firm size and cash flow are also significantly positive, while Q is insignificantly positive. Model 2 contains both U.S. and foreign firms, but it also includes a binary variable to control for U.S. firms. We again obtain a statistically significant coefficient for CEO overconfidence. We further observe in Model 2 that firm size, cash flow, Q, and the U.S. indicator variable are all positive and generally statistically significant. We examine our sample of non-U.S. firms in Model 3 and continue to find that the coefficient for overconfidence is significantly positive. Firm size and cash flow are also statistically significant and positive. These results suggest that the acquisition of unrelated targets by overconfident CEOs is as common abroad as it is in the United States. Furthermore, these multivariate results suggest that overconfidence is not a discriminating factor in explaining a CEO's decision to make either a diversifying or a nondiversifying merger offer.

In Panel B of Table 6, we reestimate these models using overconfidence estimated during 2000–2003 while examining the type of offer extended over 2004–2006. We observe that the coefficient for CEO overconfidence is consistently positive and significant. These results confirm those presented immediately above, that CEO overconfidence has an important effect on the level of merger

TABLE 6

Poisson Regressions of the Number of Nondiversifying and Diversifying Offers per CEO

In Table 6, Poisson regressions are estimated, since the dependent variable is a count of the number of nondiversifying (diversifying) offers made per CEO. A nondiversifying merger is one where the acquirer and target share the same Fama-French (1997) 48 industry group assignment. *Size* is measured as the log of assets. *Q* is the market value of assets over book value of assets. *Cash flow* is earnings before extraordinary items plus depreciation, normalized by capital. *US dummy* is a binary variable with a value of 1 for CEOs of American firms. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. Models 1 and 2 are estimated for the entire sample, and Model 3 is estimated for non-U.S. firms only. In Panel B, the number of offers is measured over 2004–2006, whereas overconfidence is estimated during 2000–2003. *Prior offers* is the number of offers during 2000–2003. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

	Nondiversifying Offers			Diversifying Offers		
	Model					
Independent Variable	1	2	Non-U.S. 3	1	2	Non-U.S. 3
Panel A. Overconfidence Estimated during 2000–2006						
No. of obs.	660	660	337	660	660	337
Overconfidence	0.40***	0.38***	0.49**	0.38**	0.37**	0.44**
	(3.17)	(3.14)	(2.57)	(2.51)	(2.45)	(1.96)
Size	0.44***	0.46***	0.12	0.53***	0.56***	0.42***
	(3.61)	(4.07)	(0.97)	(3.15)	(3.69)	(2.76)
Q	0.01	0.01*	0.01***	0.01	0.01	−0.00
	(1.51)	(1.87)	(3.21)	(0.73)	(0.73)	(−0.97)
Cash flow	0.12***	0.11***	0.11	0.13**	0.11**	0.66***
	(3.31)	(3.24)	(0.37)	(2.47)	(2.24)	(3.21)
US dummy		0.35**			0.43**	
		(2.24)			(2.09)	
Total mentions	0.02***	0.02***	0.04***	0.03***	0.02***	0.03*
	(5.50)	(4.81)	(3.48)	(4.37)	(4.02)	(1.82)
Intercept	−4.15***	−4.54***	−1.26	−5.50***	−5.92***	−4.73***
	(−3.40)	(−3.82)	(−0.95)	(−3.20)	(−3.75)	(−3.03)
Panel B. Overconfidence Estimated during 2000–2003						
No. of obs.	623	623	317	623	623	317
Overconfidence	0.48***	0.47***	0.60**	0.60***	0.61***	0.88***
	(2.80)	(2.76)	(2.33)	(3.09)	(3.06)	(3.06)
Size	0.23**	0.24**	0.11	0.10	0.08	0.35**
	(2.33)	(2.28)	(0.82)	(0.73)	(0.65)	(2.14)
Q	0.01*	0.01*	0.01**	0.02**	0.02**	0.01**
	(1.88)	(1.94)	(2.57)	(2.40)	(2.29)	(2.95)
Cash flow	0.07	0.07	0.20	0.07	0.08	0.81***
	(1.40)	(1.35)	(0.65)	(1.43)	(1.51)	(3.31)
US dummy		0.12			−0.15	
		(0.67)			(−0.72)	
Total mentions	0.00	0.00	−0.01**	0.01	0.01	−0.01**
	(0.16)	(0.16)	(2.14)	(0.51)	(0.52)	(−2.38)
Prior offers	0.04***	0.04***	0.10***	0.06***	0.06***	0.11***
	(6.61)	(5.68)	(6.32)	(7.53)	(7.92)	(7.08)
Intercept	−3.06***	−3.22***	−2.16	−2.34*	−2.15*	−5.42***
	(−3.17)	(−2.99)	(−1.51)	(−1.81)	(−1.72)	(−3.19)

and acquisition activity. This overconfidence appears to influence CEO decisions about merger targets that are both related and unrelated to the acquirer's core line of business, even while controlling for prior merger activity. Because overconfidence is measured prior to the merger offer, these results establish more firmly the argument that it is the CEO's overconfidence that stimulates the extension of a merger offer.

C. Financing Method

Overconfident CEOs not only overestimate the value they create in their acquisitions, but also in their own firms. They tend to view their firms as undervalued and are more averse to the use of equity to finance an acquisition. Hence, our expectation is that overconfident CEOs will make greater use of cash to finance their mergers.

Table 7 provides our multivariate analysis of merger financing choice. In Panel A, we present our findings for overconfidence estimated across the entire sample period with controls for total press mentions and the other factors used in our earlier analyses. In the leftmost 4 columns, we estimate our models without controlling for year fixed effects. In Model 1, we regress overconfidence against a binary dependent variable having a value of 1 if the acquisition is financed only with cash, and 0 otherwise.[7] We find that the coefficient for overconfidence is significantly positive. Model 2 includes all of the additional regressors used in the earlier analysis of the number of merger offers by overconfident CEOs.

TABLE 7

Logistic Regressions of the Method of Merger Financing

In Table 7, the dependent variable is a binary variable with a value of 1 if the acquisition is financed only with cash, and 0 otherwise. *Size* is the log of assets at the beginning of the year. *Q* is the market value of assets over book value of assets at the beginning of the year. *Cash flow* is earnings before extraordinary items plus depreciation and is normalized by capital at the beginning of the year. *Total mentions* is the total number of articles that mention the CEO. *US dummy* is a binary variable with a value of 1 for CEOs of American firms. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. Models 1–3 are estimated for the entire sample, and Model 4 is estimated for non-U.S. firms only. In Panel B, we examine mergers observed during 2004–2006, while estimating overconfidence during 2000–2003. *Prior offers* is the number of total (nondiversifying and diversifying) offers in 2000–2003. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

Independent Variable	Without Year Fixed Effects				With Year Fixed Effects			
	Model							
	1	2	3	Non-U.S. 4	1	2	3	Non-U.S. 4
Panel A. Overconfidence Estimated during 2000–2006								
No. of obs.	1,363	1,363	1,363	548	1,363	1,363	1,363	548
Overconfidence	0.45***	0.41***	0.41***	0.80***	0.42***	0.36**	0.37**	0.70***
	(3.04)	(2.78)	(2.80)	(3.24)	(2.66)	(2.34)	(2.36)	(2.73)
Size		0.07	0.07	0.00		0.09*	0.09*	0.02
		(1.30)	(1.29)	(0.03)		(1.67)	(1.64)	(0.13)
Q		−0.02*	−0.02*	−0.02***		−0.02**	−0.02**	−0.02***
		(−1.78)	(−1.79)	(−6.93)		(−2.21)	(−2.24)	(−5.00)
Cash flow		0.12*	0.12*	0.44		0.13*	0.13*	0.33
		(1.78)	(1.81)	(1.13)		(1.80)	(1.84)	(0.86)
US dummy			0.03				0.06	
			(0.17)				(0.36)	
Total mentions	−0.01	−0.01*	−0.01*	−0.03**	−0.00	−0.00	−0.00	−0.00
	(−1.55)	(−1.73)	(−1.79)	(−2.18)	(−0.63)	(−0.74)	(−0.79)	(−1.52)
Intercept	0.11	−0.43	−0.44	−0.16	1.00***	0.27	0.25	0.52
	(0.92)	(−0.83)	(−0.86)	(−0.12)	(4.32)	(0.46)	(0.41)	(0.38)

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[7]This specification of the dependent variable is consistent with the approach used by Malmendier and Tate (2008). We, however, repeat this analysis by using a binary variable that assumes a value of 1 if cash or debt or both are used for financing, but no equity, and 0 otherwise. Our results remain qualitatively identical to those reported in Table 7.

TABLE 7 (continued)

Logistic Regressions of the Method of Merger Financing

	Without Year Fixed Effects				With Year Fixed Effects			
	Model							
Independent Variable	1	2	3	Non-U.S. 4	1	2	3	Non-U.S. 4
Panel B. Overconfidence Estimated during 2000–2003								
No. of obs.	501	501	501	207	501	501	501	207
Overconfidence	0.51**	0.47*	0.46*	0.79**	0.48***	0.45*	0.44*	0.70*
	(1.99)	(1.83)	(1.81)	(2.19)	(1.88)	(1.76)	(1.74)	(1.95)
Size		0.28*	0.28**	0.23		0.27*	0.27*	0.21
		(1.96)	(1.97)	(0.79)		(1.93)	(1.94)	(0.71)
Q		−0.02**	−0.02*	−0.03***		−0.02**	−0.02*	−0.02***
		(−2.49)	(−2.43)	(−4.82)		(−2.30)	(−2.22)	(−2.91)
Cash flow		0.35	0.37*	0.00		0.32	0.34	−0.09
		(1.64)	(1.74)	(0.00)		(1.53)	(1.62)	(−0.14)
US dummy			−0.15				−0.14	
			(−0.67)				(0.55)	
Prior offers	0.00	−0.02	−0.02	−0.07	0.01	−0.01	−0.01	−0.05
	(0.37)	(−1.46)	(−1.32)	(−1.38)	(0.74)	(−1.15)	(−1.07)	(−0.93)
Total mentions	0.01	0.01	0.01	−0.02	0.01	0.01	0.01	−0.02
	(0.66)	(0.76)	(0.89)	(−0.18)	(0.79)	(0.96)	(1.07)	(−0.16)
Intercept	0.53**	−2.39	−2.32	−1.70	0.98***	−1.90	−1.83	−1.00
	(2.38)	(−1.58)	(−1.52)	(−0.54)	(3.70)	(−1.27)	(−1.20)	(−0.33)

Again, we find that overconfidence is significantly positive and contributes to an understanding of why mergers are paid for in cash. The coefficient for cash flow is also significantly positive, consistent with the argument that abundant internal resources make it more likely that CEOs will use cash rather than what they often perceive as undervalued equity to finance a deal. We find, however, that Q is inversely related to the likelihood of a cash payment for a merger. This is consistent with the belief that CEOs are less likely to view their firm as undervalued when they experience higher Q ratios. Hence, CEOs will be more willing to use equity rather than cash to finance their acquisitions. In Model 3, we include a binary indicator variable for U.S. firms. The results confirm the significance of overconfidence for explaining the choice of merger financing. Model 4 tests whether CEO overconfidence can explain the financing choice for non-U.S. mergers. We find that even with these mergers, both overconfidence and the firm's market-to-book ratio are significant in explaining the cash or equity financing choice.

The rightmost 4 columns of Panel A in Table 7 contain our regression estimates while controlling for year fixed effects. Most importantly, the coefficient for overconfidence remains significantly positive across all model specifications. The coefficients for the control variables are qualitatively similar to those obtained for the regressions without fixed effects.

We conclude from Panel A of Table 7 that CEO overconfidence is a significant factor in understanding why some mergers are financed with cash and others with equity even after controlling for firm size, internal resources, and the firm's investment opportunities. The introduction of year fixed effects has no influence on the relation between CEO overconfidence and how the firm elects to finance its merger and acquisition activity.

Panel B of Table 7 contains our results when we restrict our estimation of overconfidence to the subperiod 2000–2003 while examining the financing method used for offers extended during 2004–2006. Using the same model specifications as in Panel A, we continue to find that overconfidence exerts a significant impact on the financing choice for a merger or acquisition. That is, overconfident CEOs are more likely to use cash financing than their less confident peers. This result holds for both U.S. and non-U.S. firms. The signs and significance of the other independent variables are qualitatively comparable to those in Panel A. By separating across time the classification of a CEO as overconfident from subsequent merger offers and financing choices, we are able to establish more clearly that it is overconfidence that affects the subsequent choice of merger financing.

VI.   Cross-Country Influences on CEO Overconfidence

In this section, we examine the extent to which country-level factors might influence the nature of merger and acquisition decisions by overconfident CEOs. Based on an untabulated univariate analysis, we find that the number of offers made by an overconfident CEO is most strongly related to a country's dominant religion and Hofstede's (1980), (2001) individualism and long-term orientation cultural measures. Using these 3 country-level factors, we now examine how they might explain the total number of offers made while controlling for other factors in a multivariate framework.

In Table 8, we fit our regression model across a number of country subsamples based on these 3 cultural dimensions. CEOs are assigned to a specific

TABLE 8

Poisson Regressions of the Number of Offers per CEO
for Subgroups Based on Country Characteristics

In Table 8, because the dependent variable is a count of the number of offers made per CEO, Poisson regressions are estimated. *Size* is the log of assets at the beginning of the year. *Q* is the market value of assets over book value of assets at the beginning of the year. *Cash flow* is earnings before extraordinary items plus depreciation and is normalized by capital at the beginning of the year. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. For Hofstede's (1980), (2001) measure, the CEO of a firm is included in the high (low) group if the country in which the firm is headquartered has a Hofstede (1980), (2001) score above (below) the world median score for that measure. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

| | Model | | | | | |
| | Religion | | Individualism | | Long-Term Orientation | |
Independent Variable	Christianity	Other	Low	High	Low	High
No. of obs.	551	109	30	630	528	128
Overconfidence	0.22*	0.66	0.67	0.30***	0.10	0.66
	(1.82)	(1.38)	(1.05)	(2.66)	(0.85)	(1.53)
Size	0.50***	0.63**	0.96*	0.47***	0.51***	0.65**
	(3.53)	(2.03)	(1.80)	(3.35)	(3.68)	(2.00)
Q	0.01	−0.06	0.01	0.10*	0.08	0.01
	(0.72)	(−0.14)	(1.01)	(1.68)	(1.31)	(1.29)
Cash flow	0.12***	1.02	1.40	0.10***	0.10***	0.95*
	(3.00)	(1.50)	(1.56)	(2.92)	(3.00)	(1.72)
Total mentions	0.02***	−0.05	−0.38	0.02***	0.02***	−0.06
	(4.73)	(−0.85)	(−1.06)	(5.21)	(5.08)	(−1.00)
Intercept	−4.00***	−6.47**	−10.25**	−4.08***	−4.20***	−6.71**
	(−2.85)	(−2.08)	(−2.02)	(−2.87)	(−3.06)	(−1.96)

subsample based upon their country's Hofstede (1980), (2001) score relative to the median score for that measure or the identity of that country's primary religion. We continue to observe important cultural effects in the relation between overconfidence and the number of offers. We find that the overconfidence of CEOs in Christian countries enhances the number of merger offers made. CEO overconfidence is not statistically significant, however, for our subsample of non-Christian countries. We also observe that CEO overconfidence increases the number of offers when the CEO leads a firm headquartered in a country with a high level of individualism. Overconfidence appears not to be important when the firm is located in a country whose culture de-emphasizes individualism. Finally, we determine that long-term orientation becomes insignificant for explaining the number of merger offers by an overconfident CEO in a multivariate analysis. We conclude that cultural influences are important factors in explaining the merger offer activity by overconfident CEOs, with the effects of religion and individualism most pronounced.

Table 9 contains our analysis of country cultural effects based on the type of merger offer made. Again, our use of religion, individualism, and long-term orientation is motivated by their significance in a univariate examination of the relation between country factors and the frequency of related and unrelated offers. We observe in the leftmost columns how religion, individualism, and long-term orientation affect the decisions of overconfident CEOs about nondiversifying targets. We find that regardless of the country's primary religion, overconfidence has a positive effect on the number of nondiversifying offers. Individualism and long-term orientation, however, have a more distinct influence on the offer behavior of overconfident CEOs. We find that overconfident CEOs make more non-diversifying mergers only in countries with high levels of individualism or low levels of long-term orientation.

The rightmost set of columns examines culture's influence on the number of diversifying offers. We observe that religion has its own effect for these kinds of mergers, with overconfidence positively influencing the number of diversifying offers. We find comparable results for CEOs in countries with high levels of individualism. Unlike nondiversifying mergers, long-term orientation has no significant effect on how overconfidence influences the diversifying decision of CEOs.

We conclude this analysis of cultural factors on international merger activity by examining the effect of country factors on the choice of financing selected by an overconfident CEO. Our untabulated univariate analysis suggests that there are a number of country factors that are related to the number of cash offers extended by an overconfident CEO. These factors are used in the construction of various subsamples that are included in Table 10. We find that a greater use of cash financing by overconfident CEOs holds most strongly in countries where Christianity is the dominant religion. We further find that the Hofstede (1980), (2001) cultural measures can help to explain the merger and acquisition financing choice. Specifically, we determine that overconfident CEOs disproportionately use cash to finance their mergers when power distance, uncertainty avoidance, or long-term orientation is low.

TABLE 9

Poisson Regressions of the Number of Nondiversifying and Diversifying Offers per CEO for Subgroups Based on Country Characteristics

In Table 9, Poisson regressions are estimated, since the dependent variable is a count of the number of nondiversifying (diversifying) offers made per CEO. A nondiversifying merger is one where the acquirer and target share the same Fama-French (1997) 48 industry group assignment. *Size* is measured as the log of assets. *Q* is the market value of assets over book value of assets. *Cash flow* is earnings before extraordinary items plus depreciation, normalized by capital. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. For Hofstede's (1980), (2001) measure, the CEO of a firm is included in the high (low) group if the country in which the firm is headquartered has a Hofstede (1980), (2001) score above (below) the world median score for that measure. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

	Model											
	Nondiversifying Offers						Diversifying Offers					
	Religion		Individualism		Long-Term Orientation		Religion		Individualism		Long-Term Orientation	
Independent Variable	Christianity	Other	Low	High	Low	High	Christianity	Other	Low	High	Low	High
No. of obs.	551	109	30	630	528	128	551	109	30	630	528	128
Overconfidence	0.20	0.75	−0.20	0.31**	0.72*	0.08	0.25*	0.59	1.23	0.28*	0.12	0.61
	(1.52)	(1.64)	(−0.38)	(2.54)	(1.79)	(0.64)	(1.68)	(1.00)	(1.49)	(1.91)	(0.80)	(1.16)
Size	0.46***	0.52	1.28*	0.43***	0.57*	0.47***	0.55***	0.77**	1.14*	0.54***	0.57***	0.75**
	(3.84)	(1.63)	(1.68)	(3.54)	(1.66)	(4.05)	(3.15)	(2.11)	(1.94)	(3.07)	(3.23)	(2.10)
Q	0.00	0.09	0.03***	0.08*	0.01***	0.05	0.01	−0.14	−0.01	0.14	0.13	−0.00
	(0.99)	(0.25)	(3.08)	(1.89)	(3.30)	(1.26)	(0.54)	(−0.22)	(−0.51)	(1.43)	(1.25)	(−0.82)
Cash flow	0.11***	−0.25	−1.44	0.10***	−0.23	0.10***	0.12**	1.74**	1.67*	0.08	0.08	1.61***
	(3.29)	(−0.27)	(−0.62)	(3.30)	(−0.29)	(3.41)	(2.33)	(2.08)	(1.65)	(1.63)	(1.64)	(2.84)
Total mentions	0.02***	−0.04	−0.25	0.02***	−0.05	0.02***	0.02***	−0.01	−0.43	0.03***	0.02***	−0.07
	(5.41)	(−0.71)	(−1.49)	(5.93)	(−0.86)	(5.80)	(4.27)	(−0.92)	(−0.94)	(4.65)	(4.54)	(−1.01)
Intercept	−4.14***	−5.91*	−13.87**	−4.12***	−6.37*	−4.26***	−5.45***	−8.68**	−12.51**	−5.66***	−5.77***	−8.60**
	(−3.44)	(−1.76)	(−1.97)	(−3.36)	(−1.78)	(−3.66)	(−3.13)	(−2.41)	(−2.28)	(−3.20)	(−3.30)	(−2.23)

TABLE 10

Logistic Regressions of the Method of Merger Financing for Subgroups Based on Country Characteristics

In Table 10, the dependent variable is a binary variable with a value of 1 if the acquisition is financed only with cash, and 0 otherwise. *Size* is measured as the log of assets. *Q* is the market value of assets over book value of assets. *Cash flow* is earnings before extraordinary items plus depreciation, normalized by capital. *Total mentions* is the total number of articles that mention the CEO. The regression coefficients reported for *Total mentions* are multiplied by 100 to facilitate reporting. Results for individualism cannot be estimated due to the clustering of observations. For Hofstede's (1980), (2001) measure, the CEO of a firm is included in the high (low) group if the country in which the firm is headquartered has a Hofstede (1980), (2001) score above (below) the world median score for that measure. The *z*-statistics are in parentheses. ***, **, and * indicate 2-tailed significance at the 1%, 5%, and 10% levels, respectively.

| | Model | | | | | | | | | | | | | |
| | Legal Origin | | Religion | | Language | | Power Distance | | Uncertainty Avoidance | | Masculinity | | Long-Term Orientation | |
Independent Variable	Common	Other	Chris.	Other	English	Other	Low	High	Low	High	Low	High	Low	High
No. of obs.	1,004	359	1,286	77	997	366	1,254	109	1,181	182	186	1,177	1,272	84
Overconfidence	0.31**	0.69**	0.39***	0.38	0.29*	0.76**	0.38**	0.58	0.40***	0.46	0.81**	0.35**	0.37**	0.35
	(1.99)	(2.01)	(2.60)	(0.56)	(1.87)	(2.32)	(2.59)	(0.87)	(2.68)	(1.04)	(2.22)	(2.31)	(2.47)	(0.58)
Size	0.09**	0.04	0.08	−0.01	0.10**	0.00	0.08*	−0.16	0.10**	−0.19	−0.02	0.08	0.08	−0.02
	(1.94)	(0.28)	(1.51)	(−0.04)	(2.03)	(0.03)	(1.67)	(−0.41)	(2.06)	(−0.68)	(−0.08)	(1.61)	(1.55)	(−0.14)
Q	0.06	−0.03***	−0.02*	−0.02	0.07	−0.03***	0.06	−0.02***	0.05	−0.03***	−0.03***	0.06	0.06	−0.02***
	(0.82)	(8.59)	(−1.95)	(−0.03)	(0.85)	(−8.75)	(0.76)	(−3.09)	(0.73)	(−4.89)	(−5.27)	(0.77)	(0.86)	(−3.93)
Cash flow	0.24***	0.60	0.12*	0.17	0.25***	0.55	0.20**	1.68	0.22**	1.52	0.26	0.21**	0.21**	0.15
	(2.66)	(1.30)	(1.82)	(0.17)	(2.66)	(1.20)	(2.51)	(1.46)	(2.58)	(0.95)	(0.74)	(2.57)	(2.52)	(0.14)
Total mentions	−0.01*	−0.03**	−0.01**	−0.05	−0.01	−0.03**	−0.01	−0.04	−0.01**	−0.03	−0.05	−0.00	−0.01**	−0.00
	(−1.57)	(−2.36)	(−2.03)	(−0.36)	(−1.50)	(−2.36)	(−1.49)	(−1.20)	(−2.10)	(−1.31)	(−1.63)	(−1.09)	(−2.54)	(−0.34)
Intercept	−0.71	−0.58	−0.54	0.02	−0.76	−0.18	−0.64	2.34	−0.79	1.57	0.23	−0.62	−0.64	0.25
	(−1.37)	(−0.37)	(−0.97)	(0.01)	(−1.45)	(−0.12)	(−1.23)	(0.61)	(−1.52)	(0.54)	(0.09)	(−1.17)	(−1.16)	(0.17)

The results in Table 10 confirm the greater use of cash by overconfident CEOs, but the effect appears to possess greater cross-sectional variability than the number of merger offers made or the type of offer extended. We find that the more extensive use of cash is most prevalent in countries with Christianity as the dominant religion or where the business environment and cultural norms emphasize greater risk taking, shorter time horizons, and entrepreneurism.

VII.   Conclusion

This study is a novel examination of two fundamental research questions concerning CEO overconfidence and international merger activity. Most importantly, we test whether critical deal characteristics reported by Malmendier and Tate (2008) for a sample of U.S.-only mergers by overconfident managers also apply internationally. Given significant international variability in the regulation of corporate merger activity, varying capital market depths, and culturally based behavior differences, it is unclear whether results obtained for U.S. mergers will hold globally. We find that overconfidence is related to a variety of merger characteristics. We determine that overconfidence influences the number of offers made by a CEO, the frequencies of nondiversifying and diversifying acquisitions, and the use of cash rather than equity as the primary financing vehicle. We also observe that there are significant cultural influences on the relation between overconfidence and merger activity. We further determine that our conclusions are robust to concerns about the direction of causality by constructing a premerger measure of CEO overconfidence and relating that to subsequent merger activity as well as controlling for prior merger activity.

We also investigate whether there exist country or country group patterns in CEO overconfidence that might otherwise be masked in an aggregate international sample of mergers. The existence of commonalities in CEO demographics across legal systems or national cultures might produce similar patterns in the distribution of overconfident CEOs.

We establish a number of important findings concerning demographic and country patterns in the global distribution of overconfident CEOs. We find that overconfident CEOs tend to lead firms headquartered in Christian countries. We also find that the Hofstede (1980), (2001) measures of national culture help to explain geographical patterns in the dispersion of overconfident CEOs. Specifically, we discover that individualism positively influences the likelihood that a CEO will be overconfident. CEOs operating in countries whose cultures emphasize a long-term orientation tend to have less overconfident CEOs. We conclude that CEO overconfidence is an international phenomenon, although there are distinct patterns in its global distribution.

We conclude from our empirical analysis that overconfidence is a factor in the global market for corporate acquisitions. It is not solely a U.S. or Western European phenomenon. The presence of CEO overconfidence in the international merger market indicates that behavioral considerations might occupy an increasing importance in our understanding of executive decision making and the nature of agency conflict within the firm. Our findings also contribute to the growing

but still immature literature establishing the importance of human psychological characteristics in understanding corporate decision making.

Appendix. Overview of the Hofstede Cultural Measures

1.   Sample and Cultural Measure Construction

In 1980 Geert Hofstede published *Culture's Consequences: International Differences in Work-Related Values*, in which he develops his multidimensional framework for the analysis of culture. In this work, Hofstede (1980) statistically analyzes over 116,000 questionnaires collected in 1967 and 1973 from employees working in IBM subsidiaries distributed over 72 countries around the world. Hofstede (1980) then undertakes a country-level factor analysis of these questionnaires. From this analysis, Hofstede (1980) develops 4 dimensions of culture. A 5th dimension, the extent of long-term orientation, was added in 1991.

Each index value for these 5 factors is constructed from the mean country response scores based on questions associated with that factor. These means are calculated across a 5-point response scale for each question, ranging from 1 (very frequently) to 5 (seldom). These scores are then summed and normed to have a range between 0 (smallest) and 100 (largest).

We do not use the actual Hofstede (1980), (2001) individual scores for this analysis. Rather, we create portfolios based on the median value of each dimension. For instance, we separate specific countries into a high (low) individualism portfolio if its value on this dimension is above (below) the median score. Then, firms that are headquartered in the high-individualism countries are assigned to this portfolio and those headquartered in the low-individualism countries are assigned to the corresponding low-individualism portfolio. This approach allows us to present a number of comparisons of merger activity across country cultural differences.

2.   The 5 Cultural Dimensions

The 5 cultural dimensions identified by Hofstede (1980), (2001) are described below:

Power Distance focuses on the amount of equality or inequality between people in a country. A high power distance ranking indicates that inequalities of power and wealth have been allowed to grow within the society. These societies are more likely to follow a caste system that does not allow significant upward mobility of its citizens. A low power distance ranking indicates that the society de-emphasizes the differences between citizens' power and wealth. In these societies, equality and opportunity for everyone is stressed.

Individualism measures the degree to which society reinforces individual or collective, achievement and interpersonal relationships. A high individualism ranking indicates that individuality and individual rights are paramount within the society. Individuals in these societies may tend to form a larger number of looser relationships. A low individualism ranking typifies societies of a more collectivist nature with close ties between individuals. These cultures reinforce extended families and collectives where everyone takes responsibility for fellow members of their group.

Masculinity captures the extent to which society reinforces, or does not reinforce, the traditional masculine work role model of male achievement, control, and power. A high masculinity ranking indicates that the country experiences a high degree of gender differentiation. In these cultures, males dominate a significant portion of the society and power structure, with females being controlled by male domination. A low masculinity ranking indicates that the country has a low level of differentiation and discrimination between genders. In these cultures, females are treated equally to males in all aspects of the society.

Uncertainty Avoidance reflects the level of tolerance for uncertainty and ambiguity within the society (i.e., unstructured situations). A high uncertainty avoidance ranking

indicates that the country has a low tolerance for uncertainty and ambiguity. This creates a rule-oriented society that institutes laws, rules, regulations, and controls in order to reduce the amount of uncertainty. A low uncertainty avoidance ranking indicates that the country has less concern about ambiguity and uncertainty and has more tolerance for a variety of opinions. This is reflected in a society that is less rule-oriented, more readily accepts change, and takes more and greater risks.

Long-Term Orientation focuses on the degree to which the society embraces, or does not embrace, long-term devotion to traditional, forward-thinking values. A high long-term orientation ranking indicates that the country subscribes to the values of long-term commitments and respect for tradition. This is thought to support a strong work ethic, where long-term rewards are expected as a result of today's hard work. Business, however, might take longer to develop in this society, particularly for an "outsider." A low long-term orientation ranking indicates that the country does not reinforce the concept of long-term, traditional orientation. In this culture, change can occur more rapidly, as long-term traditions and commitments do not become impediments to change.

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