Overpriced Shares, Ill-Advised Acquisitions, and Goodwill Impairment

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Abstract

We hypothesize that the root cause of many goodwill write-offs is the overpriced shares of buyers at acquisition. Overpriced shares provide managers with strong incentives to invest, and particularly to acquire businesses, even at excessive prices and doubtful strategic fit, in order to "buy themselves out" of the inevitable price correction by portraying continued growth. We corroborate our hypothesis by documenting: (1) share overpricing is strongly and positively associated with the intensity of corporate acquisitions and the growth of accounting goodwill, (2) share overpricing is negatively related to the post-acquisition share performance of buyers, beyond the overpricing correction, indicating that many of these acquisitions are ill advised, a prelude to goodwill impairment. Effective governance mitigates these adverse effects, and (3) share overpricing is positively related to the frequency and size of goodwill write-offs. We further show that share overpricing predicts both goodwill write-offs and their magnitude—a finding of practical importance to auditors and investors—and that business acquisitions by overpriced companies—a strategy often recommended by investment bankers and some academics—is by and large a losing proposition for buyers' shareholders. Finally, we document certain serious social consequences of the goodwill-impaired, ill-advised acquisitions made by overpriced firms. These findings contribute to the accounting literature on business combinations and goodwill, as well as to the finance/economics research on investor sentiments and corporate investment.

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I. Introduction

Pictures speak louder than words: Figure 1 below presents eBay's cumulative stock return relative to the S&P 500 index over the last five years. In mid-September 2005 (see arrow), eBay acquired the Internet phone company Skype for $2.6 billion, paid in part by stock. At the time of acquisition, eBay's stock advanced over twice the S&P 500, and with the benefit of hindsight—eBay's steep stock price decline in 2006 and stagnation thereafter—its shares seem to have been substantially *overpriced* on Skype's acquisition. Things soon turned ugly for the online auctioneer, and in October 1, 2007 it announced a massive goodwill write-off of $1.43 billion related to the Skype acquisition (55% of the acquisition price). Commentators attributed, in part, the soon thereafter (January 2008) retirement of Meg Whitman, eBay's highly respected CEO, to the Skype debacle.

Figure 1
eBay vs. S& P 500: The Skype Acquisition

We hypothesize in this study and corroborate empirically that eBay's chain of events, from overpriced shares through large stock-financed but ill-advised acquisitions and ultimately to substantial goodwill write-offs is, in fact, a general phenomenon. We document a strong and monotonically positive relation between share overpricing and the intensity of stock-financed corporate acquisitions, measured by both the value and frequency of acquisitions (though not between overpricing and cash-financed acquisitions), indicating managers' penchant for using overpriced shares to time and finance corporate acquisitions. Share overpricing is also positively related to the acquirers' goodwill, suggesting a relation between overpricing of buyers' shares and overpayment for acquisition targets, a harbinger of goodwill impairment. We then document an equally monotonic and strong but negative relation between share overpricing and the buyers' post-acquisition stock returns, indicating that, on average, acquisitions financed with overpriced shares are imprudent (the target is overvalued and/or a strategic misfit for the buyer). We further show that the post-acquisition price reversal goes beyond the correction of the initial buyers' overpricing, indicating that the acquisitions were, indeed, ill-advised. Finally, we complete documenting the vicious overpricing cycle by showing a strong positive relation between acquisitions financed by overpriced shares and the intensity of goodwill write-offs, a frequent indication of the ill-advised nature of the acquisitions. We further document that overpriced shares predict both the occurrence of goodwill write-offs and their magnitude. We show throughout that effective corporate governance mitigates the adverse effects of acquisitions with overpriced shares. We thus trace the antecedents of goodwill impairment to acquisitions with overpriced shares.

We then turn to an important and unresearched issue: It is often argued by academics and practitioners that when a firm's shares are overpriced, it is beneficial to current shareholders to

overpay for a target acquisition, if needed, as long as such overpayment is smaller than the buyer's share overpricing. In such case, a subsequent goodwill write-off does not necessarily reflect negatively on the acquisition decision. It's an expected consequence of the overpayment. To determine whether overpayment for acquisitions (often leading to goodwill write-offs) is beneficial to the buyers' shareholders, and thereby to assess the economic relevance of goodwill impairment, we trace the entire history from overpriced shares, through corporate acquisitions, to goodwill write-offs, and document a sharp decrease, on average, in shareholder value. Thus, shareholders of overpriced firms do not benefit from managers' attempts to exploit or justify the overpricing of their shares by acquisitions, and the accounting event of goodwill write-off indeed reflects on the quality of managerial investment decisions. We conclude our study by documenting that in addition to the private costs of acquisitions with overpriced shares and the subsequent goodwill impairment (primarily, losses to shareholders), there are substantial social costs to these business events.

The economics underlying this adverse sequence of events, developed in the next section, are essentially as follows. Overpriced shares provide managers with strong incentives to overinvest, and particularly to acquire businesses paid for with the inflated currency (stock). The reasons: First, an acquisition with inflated shares seems a bargain as long as the acquisition price is less inflated than the buyers' shares. Thus, for example, if the buyer's stock price is twice its intrinsic value, an all-stock, fairly priced acquisition means that the buyer gives up half the value it gets. Second, overpriced shares, *by definition*, will drop substantially once investors realize they were overly optimistic (often upon the first earnings or sales disappointment). Managers obviously strive to postpone as far as possible this day of reckoning, hoping for a substantial business improvement down the road that will obviate the price correction. Some managers

sincerely believe that by acquisitions they will rejuvenate stalling growth, buying their way out of the overpricing predicament. Others perceive business acquisitions as an effective way of obscuring the overpricing (flagging growth) from investors: The buyer's sales and EPS (though rarely its return-on-equity) increase when the target is combined with it, maintaining the growth façade so treasured by investors. In fact, analysts and consultants often prescribe to slow-growth companies a business acquisition strategy to rejuvenate growth. Third, a business acquisition with overpriced shares transfers wealth from new to current shareholders, a transfer often favored by managers feeling a stronger loyalty to the latter (and, of course, to themselves, being shareholders too.) Thus, overpriced shares provide managers with strong incentives to engage in business acquisitions, and sometimes to overpay or even acquire an ill-suited target to maintain the growth facade.[1]

The first link of the overpriced shares-goodwill impairment vicious cycle—from share overpricing to excessive acquisitions—has been examined before, both conceptually and empirically (see next section). We extend this evidence by focusing on a new and important element, the quality of targets, and show that these acquisitions tend to be ill-advised (negative NPV). We add to this analysis a focus on the goodwill related to the acquisitions with overpriced shares, and make a distinction between domestic and foreign buyers. We also show that weak corporate governance exacerbates the adverse consequences of such acquisitions. The second link of the cycle—from acquisitions financed with inflated shares to goodwill impairment—is to the best of our knowledge examined here comprehensively for the first time, as is the prediction of goodwill write-offs by share overpricing. We gain further insights by incorporating in the analysis several mitigating/enhancing factors—the strength of corporate governance (investor protection) and managers' shareholding—and indeed find that effective

[1] Manipulation of sales and earnings are other means of attempting to justify overvalued shares (Jensen, 2005).

governance mitigates investor losses from acquisitions, and the inverse holds for managerial ownership. This is a particularly important link because it highlights a major cost, both private and social, of overpriced shares—botched acquisitions, as evidenced by the post-acquisitions steep stock price declines and ultimately by managers' admission of large goodwill impairment (recall eBay). Ill-timed and strategically unfit acquisitions are obviously costly to society as well, in the form of lost growth: plant closings, laid-off employees and a serious diversion of managers' attention to executing acquisitions and desperately attempting to mend imprudent ones. These findings too, are to the best of our knowledge documented first here.

We contribute to the accounting literature on business acquisitions and goodwill by identifying a major root cause of goodwill impairment—the strong incentives of managers of overvalued companies to engage in ill-advised acquisitions (overly paid for and/or strategic misfits). Most studies on goodwill impairment examine: (a) investors' reaction to the write-off announcement—it's generally negative (e.g., Li et al., 2004), (b) the characteristics of target firms related to the write-offs—generally overpaid targets (Li et al., 2004), (c) whether goodwill write-offs are timely or delayed by managers—they are delayed (Hayn and Hughes, 2006; Francis et al., 1996), (d) whether the write-offs improve financial information—they do, write-offs predict future cash flows and earnings (Anantharaman, 2007), and (e) managerial incentives affecting the write-offs—goodwill impairment is related to characteristics of debt contracts, managerial bonuses, and exchange delisting regulations (Beatty and Weber, 2006). While these findings are obviously informative, the root causes of goodwill impairment—the circumstances under which ill-advised acquisitions are being made—and the ultimate consequences of impairment to investors and society have not been investigated in the literature.

Our findings are also relevant to auditors and regulatory agencies (SEC, for example) in the context of ascertaining goodwill impairment. Goodwill (the difference between acquisition price and the fair value of the net assets acquired) has to be tested by managers annually for impairment, but such test is notoriously difficult. Unless the target's shares continue to be publicly traded—a small minority of acquisitions—there is no objective evidence of impairment. We document below that overpriced shares at the time of acquisition—we also propose overpricing proxies—predict goodwill write-offs, along with the percentage target price paid in shares and the target being a foreign enterprise, and thus provide auditors and regulators with early warnings of write-offs, and information to improve the assessment of goodwill impairment.

Our study also contributes to several strands of economics and finance research dealing with investors' sentiments (optimism) and their effects on corporate investment. In particular, while it has been shown that overpriced shares are related to corporate acquisitions, the important finding that such acquisitions tend to be ill-advised, as frequently evidenced by large goodwill write-offs, is comprehensively documented here for the first time. Furthermore, and unrelated to investors' sentiments, it has been shown that corporate acquisitions adversely affect the long-term performance of the buyers (i.e., acquisitions have, on average, negative net present value). We show below that this long-term post-acquisition underperformance can be traced back to acquisitions with overpriced shares. In contrast, acquisitions made by fairly-priced buyers do not lead to subsequent underperformance of buyers' shares. The sweeping statement, often heard, that corporate acquisitions are a losing proposition is thus inaccurate.

The order of discussion is as follows: Section II briefly discusses various key issues of overpriced shares, relating our study to extant literature, and outlines our hypotheses, while Section III presents the data, summary statistics, and our research methodology. Section IV

presents our empirical findings concerning the cycle: overpriced shares→ill-advised acquisitions→goodwill write-offs. Section V establishes that share overpricing predicts goodwill write-offs, and Section VI documents that in the final analysis, acquisitions with overpriced shares are a losing proposition. Section VII documents certain social costs of goodwill-impaired, ill-advised acquisitions, and Section VIII concludes the study.

II. Overpriced Shares and Ill-Advised Acquisitions

We discuss here various key issues related to investors' sentiments, overpriced shares and corporate acquisition decisions, as well as the extant research related to our study, ending up with our hypotheses.

A. Is share mispricing prevalent?

How prevalent is share mispricing? Can stock prices in large and active capital markets deviate over sustained periods of time from intrinsic values? No, say ardent believers in capital market efficiency. While individual investors may, of course, over- or under-price securities, such mispricings will be quickly identified and offset by sophisticated arbitrageurs in search of gains from mispriced securities, thereby reverting prices to intrinsic values. Mispricing, goes the efficient markets argument, is an isolated, temporary phenomenon.[2]

This idyllic view of capital markets governed by rational and sophisticated investors is increasingly challenged by empirical evidence showing that share prices frequently deviate from fundamentals over protracted time periods, sometimes even years (see Baker and Wurgler, 2006, for elaboration). Cases of widespread, long-lasting mispricing—overvaluations as well as undervaluations—proliferate. For example, Eberhart et al. (2004) document that the shares of

[2] A representative back-to-fundamentals view: "in fact, significant deviations from intrinsic value are rare, and markets usually revert rapidly to share prices commensurate with economic fundamentals." Goedhart et al. (2005, p. 1).

R&D–increasing companies (more than 5% annual growth) yield positive and significant risk-adjusted stock returns for up to five years following the R&D increase. Since R&D data are clearly reported to investors in quarterly income statements, the fact that these R&D-growth companies generate abnormal *future* stock returns—almost 20% in the first two years—implies that investors systematically *undervalue* their shares when the R&D information is reported, and that it takes several years for the undervaluation to be corrected. Moving to overvaluations, starting with Sloan (1996), a large body of research on accounting accruals (items comprising the difference between earnings and cash flows, such as depreciation or the stock option expense) shows that investors get enamored with companies reporting high accruals (their earnings substantially exceed cash flows), despite the fact that in many cases these earnings are of low quality (sustainability), as evidenced by the relatively low cash from operations of these companies. The evidence shows that investors systematically bid up the stock prices of such high accruals companies, only to see these prices plummet over the following two-three years.[3] Lev and Nissim (2006) report that this widespread accruals mirage persisted well into the 2000s, a decade after it was first documented, casting serious doubt about the ability and willingness of sophisticated investors to quickly eliminate share overpricing.

The evidence documenting protracted share mispricing is voluminous and growing. It points out that mispricing is particularly prevalent among young and small companies, many of whom are scantily followed by analysts ("orphan stocks") or shunned by institutional investors, that is, companies with limited and low quality information. Companies with hard to value assets and prospects, such as intangibles-intensive businesses, are also frequently mispriced, as

[3] The reverse holds for low accruals companies.

are firms in countries characterized by poor transparency or weak enforcement of securities laws.[4]

B. Where are the Arbitrageurs?

Where are the arbitrageurs that are supposed to quickly restore to fundamentals share prices overvalued or undervalued by sentimental investors?[5] The back-to-fundamentals process will, of course, work only if a sufficient number of arbitrageurs are able to identify mispriced securities and willing to buy, sell, or short them. Such arbitrage, however, is both costly and risky—one never knows how long it will take other investors to realize the mispricing, at which point the arbitrager makes money. So, there are serious cost and risk hindrances to effective arbitrage.

A particularly serious limitation to the arbitrage of mispriced shares arises from the attributes of the typically mispriced companies. Consider once more the accruals mispricing. Lev and Nissim (2006) document that indeed some active institutional investors do trade on accruals, but not in sufficient numbers and capital to eliminate the phenomenon. The reason: High accruals companies are typically small, low profits (or loss-making) and no-dividend firms with volatile stock. But these are the companies that most well-funded institutional investors—the potential arbitrageurs—shy away from, because such companies have low liquidity—that is, trading their shares has a large price impact—an obvious concern to institutions, and their high stock price volatility is an invitation to unpleasant surprises.[6] So here is a serious deterrent to

[4] Baker and Wurgler (2006) point to the difficulty to value shares as the key driver of share mispricing.
[5] Baker and Wurgler (2007, p. 129) define investor sentiment as "a belief about future cash flows and investment risks that is not justified by the facts at hand."
[6] Another reason for institutional reluctance to invest in small, volatile companies is the "prudent-man" law, frequently invoked in lawsuits filed by investors seeking damages from fund managers. Courts often ruled that if the defendant invested "prudently," generally in large, mature, and profitable companies (Wal-Mart, IBM, and Exxon come to mind), they cannot be held liable for investment losses, short of fraud (see Del Guercio, 1996).

mispricing arbitrage: Companies which are mostly affected by investor sentiments—relatively small, young, low-profitability and high volatility enterprises—are those that most institutional and sophisticated investors shun. Share mispricing of such stocks—over- or underpricing—often persists for lack of effective contrarians.

Finally, an important asymmetry, particularly relevant to our study, should be noted. Investor optimism leading to share overpricing is more likely to arise and be sustained than pessimism. Suppose investors A and B differ about the prospects of stock X: Investor A is bullish about X, whereas B believes it is overpriced. Both investors do not own X (or own small quantities only). What will these investors do to put their expectations to work? Investor A will obviously buy X, while all investor B can do is sell it short. Short sales, however, are for various reasons constrained: most individuals (for whom shorting is relatively costly) and many institutions (mutual funds in particular) do not engage in short sales. Accordingly, since buying stocks on positive views is unconstrained while selling short is, the perceptions of optimists will be reflected in stock prices more forcefully and persistently than those of pessimistic investors, leading to more pronounced overvaluation of shares even when investors' opinions about the prospects of companies are equally distributed between optimists and pessimists. Chen et al. (2002) provide empirical evidence supporting this scenario.

C. Overpricing and corporate acquisitions: Extant literature

Several studies document a positive relation between share overpricing and corporate investment. Thus, Polk and Sapienza (2004) argue that when a company's shares are overpriced, managers tend to increase capital investment, financed by cash or debt—not just by equity—to convince investors that their elevated growth expectations (optimism) are warranted. In other

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Many overpriced companies, such as small high tech and biotech firms, or recent IPOs cannot be considered "prudent" investment, and therefore will not be attractive to fund managers.

words, a high investment rate gives the firm an aura of growth. This hyper-investment by overvalued companies is indeed confirmed by Polk and Sapienza's findings, documenting furthermore that these investments are by and large wasteful (negative present value projects), as evidenced by the underperformance of the investing firms' shares subsequent to the investment spree, relative to comparable (similar risk and investment opportunities) firms.[7] Our main issue with this interesting study is that the documented underperformance of the investing companies' shares—the proof that the investments were negative net present value—may be due, partially or fully, to the inevitable price correction experienced by overvalued companies. Polk and Sapienza do control for Tobin's Q and financial slack in their analysis, but these variables may not be sufficient controls for the overpricing correction.

Dong et al. (2006) focus directly on investor misvaluations and corporate acquisitions, a dimension we too examine. The researchers' main argument should, by now, be familiar: Overpriced buyers have an incentive to acquire companies paid by shares, as long as the target is less overvalued than the buyer. Two over-valuation indicators are used by researchers: the price-to-book and the price-to-residual income value (Ohlson, 1995). The sample period is 1978-2000, and the main findings are that, as predicted, buyers have higher valuation ratios than targets (i.e., buyers are more overpriced than targets); higher target valuation (acquisition price) is associated with a higher probability that equity, rather than cash, is the means of payment; and high valuation buyers are more likely to use stock than cash for acquisitions. These findings are stronger for the 1990s than the 1980s. Overall, the authors conclude, the evidence is consistent with share overpricing driving acquisitions. We note that this study deals with the first link of our "vicious cycle"—the effect of share overpricing on acquisitions' intensity. We extend (and

[7] Stein (1996) and Baker et al. (2003) show that the investment of equity-dependent firms (those with limited internal funds and debt capacity) is more sensitive to share mispricing than that of firms that are not liquidity constrained.

update) these findings to examine the *quality* of the investments—mostly ill-advised acquisitions, and their consequences: large goodwill write-offs—thereby establishing the high costs, both social and private, of acquisitions with overpriced shares.

Our study is tangentially related to the examination of long-term post acquisition returns. Loughran and Vijh (1997) summarize their findings as follows: "During a five-year period following the acquisition, on average, firms that complete stock mergers earn significantly negative excess returns of −25.0% whereas firms that complete cash tender offers earn significantly positive excess returns of 61.7%." (p. 1765). It is an open question whether the negative long-term returns of buyers, documented by Loughran and Vijh and others (e.g., Moeller et al., 2005), are the result of ill-advised acquisitions, and/or the correction of the share overpricing of many buyers. We address this issue by distinguishing between the two drivers of negative post-acquisition returns—poor acquisitions and the overpricing correction.

Our study is also related to recent work on *managers overconfidence* (in contrast with investors' excess optimism). For example, Malmendier and Tate (2005) argue that overconfident CEOs (identified as those that do not reduce their personal exposure to company-specific risk, that is, hold on to stock options until expiration) overestimate the return on investment projects and will therefore invest in negative NPV projects.[8] So, can our findings be due to managers' overconfidence rather than to investor's over-optimism? Unlikely, because Malmendier and Tate hypothesize and corroborate that overconfident managers will use *internal funds,* rather than stock, to finance the excessive investment, since "…they are reluctant to issue new equity because they perceive the stock of their company to be *undervalued* by the market." (p. 2662,

[8] Ben-David et al. (2007) provide similar evidence.

emphasis ours).[9] We, in contrast, focus on acquisition financed by equity. The means of investment funding—cash vs. equity—appears to sharply distinguish between managers' and investors' optimism.

D. Hypotheses

Fisher and Merton (1984) argue that managers should take advantage of overpriced shares to issue stock and enhance investment, because overpriced shares implies that the firm's effective cost of capital is lower than the intrinsic-value cost of capital (the rational cost of capital), and therefore, at such below-rational cost of capital even certain investments with negative net present value (assessed at the rational cost of capital) should be accepted. Similarly, Shleifer and Vishny (2003), develop an acquisitions model particularly relevant to our hypotheses. Financial markets are assumed inefficient, so share mispricings do occur. Managers, however, can determine their firms' intrinsic value and use this knowledge for acquisition decisions. Based on their model, Shleifer and Vishny state (p. 305): "The model suggests that such [paid-by-stock] acquisitions are made by overvalued acquirers of relatively less overvalued targets." Regarding the motives of acquisitions: "The advantage of making acquisitions, aside from the positive perceived synergies, is that they contribute to the growth in earnings of the firm, and thereby help justify the high valuations." (p. 303).[10] Accordingly, we hypothesize:

H1: The extent of share overpricing will be positively associated with acquisition intensity, reflected in both the value and number of corporate acquisitions.

[9] In a subsequent paper (Malmendier et al., 2007) the authors show that overconfident CEOs are significantly *less likely* to issue equity.

[10] Why do managers of the target firms bought with overvalued shares sell their firm? Shleifer and Vishny advance two explanations (p. 303): First, target managers and shareholders, obtaining a premium over market price, sell quickly the overvalued buyer shares and therefore are not penalized by the overpricing. Second, buyers pay target managers special payments (accelerated exercise of stock options, severance pay, or offering lucrative positions at the buyer) to motivate them to sell.

We further conjecture that some, perhaps even many of the acquisitions made by overpriced companies are ill-advised (overly-paid for and/or strategic misfits) because: (1) Managers of overpriced companies know that it is "rational" to overpay for the target (as long as such overpayment is lower than the overpricing of their own shares), but both own share overpricing and target business valuation are very uncertain and difficult to assess. In contrast with the Shleifer and Vishny (2003) assumption, no manager in reality has *perfect knowledge* of own firm's intrinsic value, and definitely not of the target's intrinsic value. Consequently, some corporate buyers may actually overpay for the target *more* than their shares' overpricing. (2) Acquisitions by overpriced companies are often made primarily to keep the "appearance of growth" going. Such acquisitions are frequently made in haste and under pressure, increasing the likelihood of making valuation mistakes and overpaying for the targets, or even acquiring businesses which do not fit the buyer's long-term strategy, just to enhance short-term earnings and sales. (3) As noted by Shleifer and Vishny, the overpricing of buyers' shares gives strong incentives to key target employees to sell the shares they obtain as soon as possible and switch employment to prevent their newly-acquired wealth from evaporating. The defection of key target employees will obviously adversely affect the acquisition success. Accordingly we hypothesize:

H2: The investments made by overvalued companies will include ill-advised (misfit) acquisitions as characterized by: (1) subsequent negative excess returns, and (2) large goodwill write-offs.

Effective corporate governance will discipline opportunistic acquisition decisions, in particular the strategic misfit or excessively overpaid acquisitions made by managers for the sake of justifying the buyers' overpriced shares. Accordingly:

H3: Both the acquisition intensity of overpriced companies and the adverse consequences of these acquisitions (goodwill impairment) will be mitigated by effective corporate governance.

The adverse consequences of acquisitions made by overpriced firms exceed the visible effects of goodwill impairment and the associated negative market reaction. They include massive employee layoffs, plant closings and decrease in innovation investment. Accordingly:

H4: The ill-advised acquisitions by overvalued firms cause serious private and social harms, particularly plant closings and employee layoffs.

III. Data, Methodology, and Summary Statistics

We obtained our sample from the SDC database on mergers and acquisitions. The initial sample consists of all U.S. publicly traded firms that undertook mergers and acquisitions between January 1, 1990 and December 31, 2006. We include acquisitions of both U.S. and foreign enterprises as well as acquisitions of public and private targets. We exclude the following observations: (1) the value of the transaction is not disclosed, (2) the percentage of shares acquired in the transaction is less than 90%, and (3) the value of the transaction is more than 100% or less than 1% of the acquiring firm's market value. We also require sample firms to have accounting data in COMPUSTAT and stock price and return data in CRSP.

Our indicators of the extent of share overpricing—a key element of this study—are based on four measures: the industry-adjusted price-to-earnings (P/E) ratio, the amount of discretionary accruals, stock price momentum, and prior equity issuance. The reason for using four overpricing proxies, and our construction of an index reflecting the incremental information in each proxy with respect to overpricing, is straightforward: there is no single *ex ante*

comprehensive measure of share mispricing.[11] Accordingly, researchers (Baker and Wurgler 2006; Polk and Sapienza 2004) construct indices from several proxies of mispricing, and we follow this approach. Our four proxies are comprised of three measures used by Polk and Sapienza (2004): *discretionary accruals* (Sloan's 1996 evidence suggests the existence of systematic mispricing related to accruals); *net equity issuance/repurchases* (evidence indicates that equity issues (repurchases) predict subsequent low (high) stock returns, namely mispricing; Daniel and Titman, 2001); and *price momentum* (evidence indicates that yearly excess returns exhibit positive serial correlation, that is momentum is a mispricing phenomenon; Jegadeesh and Titman, 1993). Concerning these three mispricing proxies, Polk and Sapienza (2004, pp. 21-22) note: "One problem with the previous two proxies of mispricing [accruals and equity issues] is that managers affect discretionary accruals, equity issuance, and investment [the focus of their study]. Our results indicate that there is correlation between investment and both discretionary accruals and equity issuance, but they can hardly say anything about the direction of the causality. While high discretionary accruals may cause sub-optimal investment decisions managers may decide to manipulate accruals to be able to invest more… Our next measure of mispricing [price momentum] suffers less from the reverse causality problem because it is not directly chosen by the manager, and more generally reflects investors' sentiments."

To these three overpricing proxies we add the price-to-earnings (P/E) ratio, the most widespread mispricing proxy used by investors.[12] The industry-adjusted P/E ratio we use is the difference between the firm's P/E and the industry median P/E for all the firms in the sample company's 4-digit SIC industry. To assure that the industry median P/E ratio is properly

[11] *Ex post*, overpricing is evident by negative returns, although it is difficult to isolate the effects of the overpricing reversal on subsequent returns from the impact of the firm's contemporaneous operating performance on returns.
[12] Dong et al. (2006) in their study of overpricing and corporate acquisitions, use a highly correlated, but somewhat less frequently used measure—the price-to-book ratio.

computed, we excluded in its computation firms with negative P/E ratios and those with P/E ratios greater than 100. We also exclude from our final sample firms with negative P/E ratios. We measure the discretionary component of accounting accruals following Chan et al. (2001), where discretionary accruals are defined as the difference between the firm's total accruals and "normal accruals," deflated by average total assets. Total accruals are measured as the difference between earnings before extraordinary items and cash from operations, and normal accruals are the product of the firm's current sales times the ratio of the sum of total accruals to the sum of sales over the prior five years (year t–5 to year t–1). Price momentum is the firm's market-adjusted return for the 11-month period that ends one month before its fiscal year-end. Equity issuance is measured as the total amount of equities issued by the firm over the most recent three years (year t–2 to year t), deflated by lagged total assets.

To construct an overvaluation index we perform a principal component analysis summarizing the incremental information on firm valuation contained in the four overpricing proxies. To discern from our data the relations among the overpricing proxies to the fullest extent, we include in the principal component analysis all available firms, not just corporate buyers, with the required accounting and stock return data. To enhance our estimation of share overpricing we use in the following analysis the first two principal components, which together account for 53.3% of the total variability. In our subsequent tests and regression analyses, we use these two principal components as the firm-specific composite indicators of share overpricing (*OVE1* and *OVE2*, respectively).

Figure 2 demonstrates that our two overpricing indicators indeed successfully reflect share mispricing, by showing continuously decreasing *subsequent* (to overpricing) abnormal returns, as one moves from low (underpricing) to high overpricing. The three bars for each

overpricing group reflect subsequent returns to *OVE1*, *OVE2*, and the combined indicator of *OVE1 & OVE2*. To construct the combined indicator of *OVE1 & OVE2* in Figure 2 (right bar in each triplet), we first rank the sample firms each year (1990-2006) by quintiles of the first (*OVE1*) and the second (*OVE2*) principal components of the four overpricing proxies. We then focus (here and in the subsequent tests) on the *main diagonal* of this 5×5 table, namely the intersection of firms with the 20% lowest *OVE1 and OVE2I* indicators (least overvalued firms), the intersection of firms with the 20% second-lowest *OVE1* and *OVE2,* …, ending up with the fifth group—the intersection of the firms with the 20% highest *OVE1* and *OVE2* indicators (most overpriced firms). Finally, we compute the one-, three-, and five-year mean annualized excess (four-factor model) returns *subsequent* to the overpricing measurement. It is evident from the three panels of Figure 2 that the excess subsequent returns decrease monotonically from the least (underpriced) shares to the most overpriced shares (from left to right of figure). The strongly decreasing trend of subsequent returns is evident for the two principal components, *OVE1 & OVE2*, individually, and even more pronounced for the combined indicator, *OVE1 & OVE2*. Furthermore, the decreasing returns are evident in the one- , three-, and five-year subsequent returns graphs. Our share overpricing indicators indeed strongly reflect the overpricing phenomenon.

We measure the intensity of corporate activities for each firm-year by the total *number* of transactions undertaken by the firm in the current year (*NUM*), as well as in the next one, and next three years, and by the combined *value* of all transactions in the current year (and subsequent years), deflated by the acquiring firm's market value at the beginning of the year (*VALUE*). For firm-years with no acquisition activities on the SDC database, the value of these two variables is set to zero. We also compute the two acquisition intensity measures, *NUM* and

VALUE for the subsamples of transactions that are financed fully by stock or by cash. For each firm-year, we also compute across all acquisitions the average percentage of the transaction value that was paid by stock (*STOCK%*).

Table 1 provides summary statistics for the firms we study. Panel A refers to *all* firms with available data, whereas Panel B focuses on acquiring companies. The data indicate that buyers are larger than non-buyers (the formers' median market value is almost twice the latters'), and have a substantially higher industry-adjusted P/E ratio. As to the four components of the overpricing index, buyers have larger discretionary accruals, higher price momentum, more equity issued, and a higher relative P/E ratio than non-buyers. This is the first indication that the shares of acquiring firms, as a group, are more overpriced than those of non-acquiring firms. Panel C of Table 1 provides the numerical data of monthly abnormal returns underlying Figure 2 (subsequent returns to the overpricing indicators). The correlations matrix (Table 2) indicates that our two overvaluation indicators, *OVE1* and *OVE2*, are only marginally negatively correlated (–0.063, Spearman), supporting our use of both indicators in the subsequent analyses.[13]

IV. Empirical Tests

We employ two methodologies to examine the various hypothesized relationships. The first, a simultaneous classification of the observations by quintiles of the two overpricing indicators (principal components) and the second—what else—a regression analysis.

A. Share overpricing and acquisition intensity

[13] The two indicators are, of course, uncorrelated in the sample of all firms from which they are estimated. In the subsample of buyers the two overvaluation indicators are slightly negatively correlated.

Table 3 reports the association between share overpricing and firms' acquisition intensity over the three years subsequent to overpricing. Panel A of Table 3 presents the mean acquisition value and frequency for the main diagonal of the sample firms classified by quintiles of the two overpricing principal component indicators (*OVE1* and *OVE2*). Thus, for example, the left cell (titled Lowest-lowest) includes all firms that were classified by *each indicator* as the 20% least overpriced, whereas the right cell (Highest-highest) includes all firms classified in the 20% most overpriced category by both *OVE1* and *OVE2*. Moving along the diagonal of mispricing (from left to right across each row), the data in Panel A show a strong and monotonic increase in both mean acquisition value (divided by market value) and the mean number of acquisitions (in parentheses). Thus, for all sample firms (first row in Table 3), as one moves from the least to the most overpriced buyers, acquisition value (number) increases from 0.067 (0.234) to 0.191 (0.833), namely a three-fold increase. A monotonic increase in acquisition intensity holds also for the subsample of acquiring companies (second row).

We also report in Panel A (for "all firms" and for "acquirers") the mean percentage change in accounting goodwill over the three years subsequent to overpricing. For both groups of firms it is evident that the change in goodwill increases monotonically along the share overpricing scale. Thus, for "all firms" ("acquirers") the goodwill growth is 0.5% (6.9%) for the least overpriced firms, and 9.8% (28.5%) for the most overpriced firms. Since goodwill is a proxy for *overpayment* in acquisition, the data indicate that share overpricing leads to acquisition overpayment (recall the recommendations of Fisher and Merton (1984), and Shleifer and Vishny (2003), above), which is a harbinger of goodwill impairment.[14]

[14] Goodwill reflects, of course, not only overpayment, but also unidentifiable intangible assets, which are also prone to impairment.

The next four rows of Table 3, Panel A present the overpricing diagonal data for stock-only and cash-only acquisitions, from the least (left) to the most (right) overpriced buyers. It is clear that the increasing trend of acquisition-intensity exists for acquisitions-by-stock only. For cash-financed acquisitions, the acquisition value is roughly flat along the overpricing scale, whereas the number of subsequent acquisitions increases monotonically, though at a substantially lower rate than stock acquisitions.

Examining sub-periods (bottom half of Panel A), we note that the tendency of acquisition intensity to increase with overpricing is strong in the first two sub-periods, 1990-1995 and 1996-2000, but weakens somewhat for acquisition value (though not frequency) in the recent sub-period, 2001-05. The reason, perhaps, is that the first couple of years of this sub-period, 2001 and 2002, for which we have full subsequent three-year data, were recession years with a lagging capital market performance, which generally adversely affects the acquisition activities of firms, including that of overpriced companies. All in all, though, our findings are not period specific.

Panel B of Table 3 presents estimates of a logistic regression, where the dependent variable is having (denoted by 1) or not having (denoted by 0) acquisitions in the following (to overpricing) three years. In addition to our two indicators of overpricing (*OVE1* and *OVE2*), we include among the independent variables the common controls for corporate acquisition intensity: firm size (*Log(MV)*); availability of cash, measured by cash flows from operating activities (*CFO*); the capital market performance indicator (S&P 500 return, *SP500*)—acquisition intensity is positively correlated with the market—and industry dummies. We also include a governance strength variable (used by Gompers, Ishii, and Metrick, 2003), to examine whether effective governance disciplines managers of overpriced firms from engaging excessively in acquisitions, and a managerial ownership variable (reflecting the percentage of

total shares outstanding held by executives with at least 1% of ownership (excluding options)) to test whether large ownership (stake in firm) increases managers' incentives to engage in acquisitions to "buy themselves out" of the overpricing predicament. The logistic regression estimates in Panel B indicate that the two overpricing indicators, *OVE1* and *OVE2*, our focus of analysis, are positive and statistically significant, indicating that share overpricing is positively related to subsequent acquisition intensity. Weak governance enhances, as expected, acquisition intensity, as does managerial share ownership. The effect of managerial ownership is concave, as indicated by the significant negative coefficient of $(MOWN\%)^2$. Thus, as their ownership increases, managers are more reluctant to engage in growth-pretending acquisitions to convince investors of overpriced shares that firm growth continues, getting more concerned about the long-term adverse effects of these acquisitions on their own share-value. The coefficients of the other control variables in Panel B are as expected.[15]

Panel C of Table 3 extends the logistic analysis to a distinction between domestic and foreign targets. This is important because there are claims that owners of foreign companies are reluctant to accept shares of U.S. buyers, due to "home bias" (Zenner et al., 2008). Such reluctance may grow with the overpricing of the U.S. buyers' shares. However, the estimates of *OVE1* and O*VE2* in Panel C do not indicate a weaker impact of share overpricing on acquisitions of foreign targets. In fact, the estimates of *OVE1* and *OVE2* are larger in the regression of foreign acquisitions than domestic acquisitions (0.281 vs. 0.239 for *OVE1* and 0.205 vs. 0.080 for *OVE2*), suggesting a stronger impact of share overpricing on buyers' motives to acquire foreign targets. The stronger relation between share overpricing and acquisitions of foreign targets apparently reflects buyers' belief that growth in foreign markets via acquisition can give

[15] In un-tabulated results, we document that the logistic relation between share overpricing and acquisitions holds for sub-periods, and for stock-financed acquisitions, and to a substantially lesser extent for cash-financed acquisitions.

investors an even stronger impression of the buyer's growth prospects. This belief is likely fueled by the significant valuation premium that investors are willing to pay for earnings from foreign markets, due to the perceived differences in growth opportunities between domestic and foreign operations (Bodnar and Weintrop, 1997). Thus, our evidence further indicates that acquisitions linked to share overpricing are driven by buyers' craving for growth and expansion that help justify the high valuation of the buyer's stock.

Panel D of Table 3 presents OLS regression estimates for the dependent variable—total acquisition *value* (scaled by total assets). These regressions are obviously run only on firms with acquisitions in the subsequent (to overpricing) three years.[16] We note that for all firms with acquisitions and for stock-financed acquisitions, the coefficients of the two overpricing indicators are positive and significant. In contrast, for cash-based acquisitions, the overpricing coefficients are insignificant. Thus, share overpricing is positively related to acquisition value for stock-financed acquisitions only.

Finally, Panel E of Table 3 focuses on the accounting aspect of acquisitions by overpriced companies, reporting regression estimates of the growth in goodwill during the subsequent three years (dependent variable) run on share overpricing indicators and control variables. For all three regressions—all firms, acquirers, and acquirers with goodwill—the overpricing coefficients are positive and statistically significant. As expected, the coefficients are largest for "acquirers with goodwill." Thus, goodwill in acquisition is positively related to share overpricing prior to acquisition.

[16] The standard errors and t-statistics in this regression are obtained by following the clustering approach prescribed by Peterson (2006). This approach mitigates the effect of cross-sectional correlation in the regression residuals that may lead to biased standard errors of coefficient estimates in OLS regression. It produces unbiased estimates of standard errors and hence generates robust inferences about the statistical significance of coefficient estimates.

Bottom line, our tests strongly confirm the hypothesis that acquisition-intensity (value, as well as the number of acquisitions) is positively related to the overpricing of the buyers' shares. This relationship is strong for acquisitions financed by shares, and weaker, though still present, in cash-financed acquisitions.[17] The relation also holds for sub-period. Weak corporate governance and substantial managerial shareholding enhance the relation between share overpricing and subsequent acquisition intensity. In a preview to the goodwill impairment analysis, we document that the extent of buyers' share overpricing is positively related to the subsequent growth in goodwill, suggesting that as overpricing increases, so does the overpayment for the target, in accordance with the "rational investing" prescribed by Fisher and Merton (1984) and Shleifer and Vishny (2003), discussed in Section II.D. We move now to examine the *quality* of acquisitions by overpriced firms, searching for the root cause of goodwill impairment.

B. Post-Acquisition Stock Returns

Previous research (e.g., Loughran and Vijh, 1997) indicates that the long-term performance of acquiring companies lags the benchmarks, thereby casting doubt on the advisability of acquisitions in general.[18] But this negative performance of buyers can be due to ill-advised or overpaid acquisitions—the common conclusion of this research—and/or to the return reversal (price correction) of overpriced companies which, as our evidence above shows, are particularly active in acquisitions. To relate goodwill impairment to its hypothesized root cause—ill-advised acquisition by overpriced firms—it is therefore important to distinguish

[17] Polk and Sapienza (2004) argue that overpriced companies will overinvest, using cash or debt, not just stock, in order to convince investors that the high price multiples are justified by corporate growth.

[18] This led some commentators to conclude that the major reason managers acquire businesses is to inflate short-term reported earnings and sales.

between the quality of acquisitions of overpriced buyers and their price reversal, both reflected by the negative long-term post-acquisition performance of buyers.

Table 4 presents the five-year abnormal returns subsequent to acquisitions made following the overpricing measurement. These abnormal returns are computed using the Fama-French 4-factor model which takes into account the following return-generating factors: market return, firm size, book-to-market, and the return momentum. The results in Panel A confirm extant evidence that acquiring firms tend to have abnormally low returns in the five years following acquisitions, with stock-financed acquisitions performing the worst. Thus, for example, for acquisitions made during the year (t+1) following the buyers' overpricing measurement (top three lines in Panel A), the average monthly subsequent abnormal return is –0.24% (statistically significant) for "all acquisitions", and –0.45% (roughly 6% annually) for stock-financed acquisitions. The abnormal post-acquisition returns on cash-financed deals are insignificantly different from zero. The return estimates for acquisitions made in years t+2, t+3, (relative to overpricing), and all three years combined, follow a similar pattern.

Panel B of Table 4 (firms in the main diagonal of the two overpricing indicators) shows that for quintiles 1 (lowest overpricing) through 3, the post-acquisition returns are in fact *positive,* and monotonically decreasing. In particular, Quintile 1's acquisitions (made by least overpriced companies) are evidently positive net present value (NPV), on average (coefficient 0.0047, t-value 1.94). Thus, shown here for the first time, acquisitions made by fairly-priced companies are, on average, successful, yielding roughly a 6% mean abnormal return in the five subsequent years. Things are drastically different, however, for quintile 4 and 5 (medium-high and high-high)—the 40% most overpriced buyers—where the five-year post-acquisition returns are increasingly negative and statistically significant. For quintile 5 buyers ("all acquisitions,"

top rows), the mean annual abnormal return is a sizable negative 13–15%. No wonder that this group of acquirers experiences the highest amounts of goodwill write-offs (next subsection). This result is very pronounced for stock-financed acquisitions, but not for cash-financed acquisitions. Furthermore, these results also hold for acquisitions made in years t+2 and t+3 relative to the overpricing measurement (lower part of Panel B).

We conclude from this analysis that while, on average, the long-term, post-acquisition performance of buyers is negative, consistent with prior findings, this negative performance is driven by overpriced buyers. The acquisitions made by fairly-priced companies are positive NPV, on average. This still leaves open the important question whether the negative post-acquisition returns of the overpriced buyers reflect ill-advised acquisitions (precursor to goodwill impairment) and/or the overvaluation price reversals. This question, not addressed in earlier research, is examined in Table 5, where we compare the returns of *non-acquiring* firms, classified by degree of overpricing (our benchmark), with the post-acquisition returns of similarly classified *acquiring* firms. This comparison, thus, holds constant the degree of overpricing and the consequent reversal of stock prices due to overpricing, thereby focusing on buyers' negative returns due to ill-advised acquisitions.

The data in Table 5, Panel A show that for quintiles 1-3, the fairly priced to moderately overpriced companies, the 5-year stock performance of *non-acquiring* companies (top row) is positive and somewhat higher than that of *acquiring* firms (middle of Panel A). However, for quintiles 4-5 (right-side two columns), the 40% most overpriced companies, the five-year stock performance of acquiring companies is significantly *more negative* than that of similarly overpriced, non-acquiring companies. Thus, for example, the post-acquisition abnormal returns of the 20% most overpriced firms with acquisitions in the year following overpricing are –1.62%

(monthly) vs. –1.13% for the most overpriced firms with no-acquisitions.[19] The difference between these returns is statistically significant at the 0.01 level (bottom rows of Panel A). This negative return differential reflects the fact that many of the acquisitions made by overpriced *buyers* were indeed ill-advised—overpaid for and/or strategic misfits.[20] This evidence, focusing on the quality of acquisitions by overpriced firms, distinct from the overpricing reversal, extends the extant evidence that overpricing leads to excessive acquisitions (Dong et al., 2006), as well as clarifies that the documented underperformance of acquiring companies (Loughran and Vijh, 1997) is partially due to the inevitable price reversal of overvalued shares, but also due to the ill-advised acquisitions made by excessively overpriced firms.

Our conclusion about the ill-advised acquisitions made by overpriced firms is supported by the data in Panel B of Table 5, where we classify the acquiring firms by the strength of their corporate governance, and show that except for the least overpriced companies (Lowest-lowest), the post acquisition abnormal returns of weak-governance companies (top of panel) are lower that those of strong-governance buyers. For the most overpriced buyers (right column) the difference in monthly abnormal returns, –1.89% vs. –0.5%, is very large and statistically significant. Good governance apparently constrains managers from engaging in ill-advised

[19] As the data in Table 5 show, the *extent* of overpricing is similar for corresponding quintiles of acquiring and non-acquiring firms. In panel A, both the *t*-test and Wilcoxon *z*-test fail to reject the null hypothesis of equality of mean and median values of *OVE1* and *OVE2* between the corresponding quintiles of acquiring and non-acquiring firms. Same holds for Panel B of Table 5.

[20] Our findings here, that the post-acquisition long-term returns of overpriced buyers are significantly *more negative* than the long-term returns of similarly overpriced non-acquiring firms contradicts a major implication of the Shleifer and Vishny (2003) model: "The total observed return [of buyers] may still be negative, especially if the initial overvaluation is significant, but this does not mean that the acquisition does not serve the interests of the bidding shareholders. Indeed, when $P < S$ [P is the acquisition price and S is the perceived synergy], bidding shareholders gain in the long-run even when the observed stock returns are negative: returns are just not as negative as they would have been without the acquisition." (p. 301). Not so. Our evidence shows that the buyers' long-term returns are *more* negative than similarly overpriced non-buyers. The acquisitions, on average, were not in the best interest of bidders' shareholders.

acquisitions to mask the share overpricing.[21] This established low quality of acquisitions made by overpriced companies, particularly with weak governance, leads directly to the final link in our chain of hypothesized events: goodwill write-offs.

C. Acquisitions and Goodwill Write-offs

The final link of the hypothesized vicious cycle—from share overpricing to the consequences of ill-advised acquisitions—deals with managers' admission of the failed acquisitions—the write-off of goodwill values on buyers' balance sheets. Table 7 reports the relation between share overpricing and goodwill write-off by quintiles (main diagonal) of overpricing, as well as by regression analyses relating overpricing during 1991-2000 to the total amount of goodwill write-offs (scaled by buyers' total assets) during 2001-2006. Considering the top row of Panel A, reflecting all sample firms (with and without write-offs): the average goodwill write-off increases monotonically with the buyers' share overpricing, from 0.0033 (goodwill write-off scaled by total assets) for the 20% firms with the lowest overvaluation to 0.0206 (six fold) for the 20% firms with the highest share overpricing. The second row of Panel A shows similar results for the subgroup of firms with write-offs in 2001-2006: The average write-off increases from 0.0284 (lowest overpricing) to 0.1012 (highest overpricing). For firms with acquisitions in any year during 1991-2000 *and* goodwill write-offs in 2001-2006 (fourth

[21] Our evidence on the low-quality acquisitions made by overpriced buyers is based on the subsequent returns of buyers. To expand the scope of evidence, we report in Table 6 results based on financial statement performance. Panel A shows that whereas the pre-acquisition mean ROA was significantly higher for acquirers (0.0181) than non-acquirers (0.0142), as were the median ROAs, in the post-acquisition period the relation reverses, the profitability of acquirers is lower than that of non-acquirers (the means' difference is insignificant, but he medians' difference is significant). Panel B of Table 6 shows that the number of acquisitions (*NUM*) has a significantly negative relation with the firm's future profitability, with the effect more pronounced for firms with future goodwill write-off. It also shows that the overpricing indicators, *OVE1* and *OVE2,* are substantially more negatively associated with the future profitability of acquirers than non-acquirers. Conclusion: acquisitions negatively affect the profitability of buyers, on average.

row), the average write-offs increase from 0.0225 to 0.1367. Thus, the goodwill write-offs of the 20% most overpriced buyers in this category amounted to a startling 13.7% of their total assets.

To solidify the hypothesized causation from buyers' share overpricing to goodwill write-off, we present in lines 5 and 6 of Panel A data on the frequency of lawsuits alleging share price manipulation by acquirers (that is, buying with inflated stock). Line 5 reports for all acquiring firms (at lest 30% of acquisition price paid with shares) the percentage of lawsuits by overpricing quintiles: The lawsuit frequency rises from zero lawsuits against the least overpriced companies, to 14.29% of sued firms in the highest overpriced quintile. Line 6 restricts the sample to firms with goodwill write-offs in 2001–2006, and shows that the frequency of lawsuits increases from zero to 43.75%! Thus, according to plaintiffs, their losses from goodwill write-offs are traced back to the share overpricing (allegedly caused by managers' manipulation) at acquisition. (Panel C of Table 7 confirms by a logistic analysis that share overvaluation is positively related to subsequent lawsuits.)

Panel B of Table 7 reports regression estimates (Tobit and OLS) of the amount of goodwill write-off (scaled by total assets) regressed on the two overpricing indicators (principal components), *OVE1* and *OVE2*, as well as on the percent of acquisition price paid in shares (*STOCK%*), the buyers' size (*Log(MV)*), and industry dummies. Since the goodwill impairment regulation (SFAS No. 142) came into effect in 2001, it may be that the write-offs recognized in 2001–2002 were particularly large—a catch up of previous years unrecognized impairments—and therefore unduly affect our results. Accordingly, we include in the regression the variable *TRANSITION*—a dummy variable for goodwill write-offs recognized in 2001–2002. We also include among the independent variables an indicator for foreign targets (*FOREIGN%*)—the percentage of foreign targets in all acquisitions—and the governance quality variable

(*WEAK_GOV*). The estimates in Panel B show that in all the regressions, the two overpricing indicators are positive and highly significant (except for *OVE2* in the Tobit analysis). The variable *TRANSITION* (write-offs in 2001–2002) is indeed significant, but does not detract from the significance of the overpricing indicators. Foreign targets add marginally to the amount of write-off. This analysis thus confirms the last link of our cycle: Buyers' overpriced shares are closely associated with the write-off (impairment loss) of the goodwill related to their acquisitions, just as in the eBay example that leads this study.

V. Share Overpricing Predicts Goodwill Write-offs

Given the difficulties in ascertaining goodwill impairment (no market price for goodwill), required by GAAP on an annual basis, any early warning indicator of impairment will obviously be of considerable importance to auditors, managers' and regulators (SEC). Accordingly, we report in this section on the ability of our overpricing indicators *to predict* the subsequent goodwill impairment; both its occurrence and magnitude. We consider each firm-year with acquisitions an observation, and for firms with multiple acquisitions in a given year we aggregate their individual firm-year observations into one, recording both the number of acquisitions and their total value. We then run both a Logit and a Tobit analysis; the former with the dependent variable goodwill impairment (1), and no impairment in future years (0); and the latter (Tobit) with the size of impairment in future years (relative to total assets) as the dependent variable. The independent variables are our two overpricing indicators (*OVE1* and *OVE2*), along with a variable distinguishing between domestic and foreign targets (*FOREIGN%*), defined as the percentage of foreign targets (in terms of number of acquisitions) in the firm's total acquisitions in a given year. Foreign acquisitions differ from domestic ones along institutional, economic, and accounting dimensions, calling for a distinguishing variable. The remaining independent

variables—amount of goodwill, buyer's size, acquisition value, percentage of acquisition price paid in stock, and industry dummies—serve as controls.

Table 8 reports the Logit and Tobit estimates. It is evident that in both panels the two overpricing indicators are positive and highly significant. The right columns of the Logit and Tobit tables indicate that the marginal predictive contribution of the overpricing indicators is the highest among the independent variable (except, of course, for the size of goodwill). The percentage of acquisition payment in stock is highly significant, though its contribution to the prediction of goodwill write-off is small. The number of acquisitions (*Log(NUM)*) is significant and its contribution to write-off prediction is relatively large, suggesting that when managers engage in multiple acquisitions, often to justify the share overpricing, such acquisitions tend to be ill-advised (overpaid and/or strategic misfits). The foreign acquisitions variable is positive and significant in the Tobit regression, suggesting that the generally lower information quality about foreign targets enhances the likelihood making poor acquisitions. We conclude, therefore, that buyers' share overpricing has a significant predictive ability with respect to subsequent goodwill impairment, with the number of acquisitions and their locality (domestic vs. foreign) as additional warning signs of impending write-off.

VI. Was It All Worth It?

An important question not comprehensively researched in the literature is: What are the economic implications of goodwill write-offs? Are these write-offs a benign accounting ritual or an important business event? Do goodwill write-offs signal imprudent acquisition decisions, or perhaps goodwill impairment is just a byproduct of successful *market-timing motivated* acquisitions? Indeed, managers of goodwill-impaired firms often try to assuage concerned directors and shareholders by claiming that in order to get the deal done, they had to overpay for

the target (necessarily leading to the write-off), but that the overpayment was made with shares which were even more overvalued than the target (recall the prescriptions in Fisher and Merton (1984) and Shleifer and Vishny (2003)). In the final analysis, goes the argument, shareholders benefit from the acquisitions, even considering the excessive price paid. According to this scenario, the goodwill write-off is an economic non-event.

Consider the following comments made by Anthony Muller, the CFO of JDS Uniphase, in a 2001 conference call after the firm announced a whopping $44.8 billion goodwill write-off from various acquisitions made during the tech bubble of the late 1990s: "This goodwill resulted from our acquiring good companies when valuations were high. But keep in mind that while we purchased highly valued shares, we were also in effect selling [our] highly valued shares at the same time as none of the transactions resulting in large goodwill amounts were done for cash. Had these transactions been done at different times when valuations were lower with exactly the same share exchange ratios, the goodwill amounts would have been considerably smaller." (Pender, 2001). So, is goodwill impairment a byproduct of good investment decisions or a consequence of poor ones? An obviously important question to investors and accounting researchers.

We examine the relevance of goodwill write-offs by tracing the fortunes of goodwill-impaired firms from acquisition through the write-off. We focus on two performance measures: abnormal stock returns and the return-on-assets (before impairment losses). Table 9 provides the data for both the year-by-year performance around acquisition and write-off, and for the entire trip from acquisition through the write-off (right column). Panel A provides the benchmark: Acquiring firms without subsequent write-offs. From the year before acquisition through the sixth year after it, the cumulative mean and median abnormal stock return were 38.8% and

19.4%, respectively. Not spectacular, but a decent good return indeed. Things are very different for firms with goodwill write-offs, as reported in Panel B. Notably, of the 504 firms for which we have complete data on acquisitions and goodwill write-offs, 100 firms (20%) did not survive three years after write-off (they were bankrupt or acquired). Data for the 404 firms that made it through the third year after write-off (Panel B) indicate that both the mean and median returns of the full trip (from acquisition through write-off) were decidedly negative: –31.6% and –42.8%, respectively. As expected, performance was even more dismal (Panels C-E) for the impairment firms that survived less than three years after write-off. The large and negative return-on-assets figures in Panel B are consistent with the negative stock returns. Finally, for all 504 impaired firms (Panel F), the full-trip mean (median) returns are –21.7% and –38.4%, respectively.

Our evidence is thus inconsistent with the argument that goodwill impairment is an expected outcome of a rational investment decision: to overpay for targets acquired with inflated shares. Note that the dismal performance of goodwill-impaired firms is not "by construction." If the decision to overpay for the target acquired with inflated shares is a rational one, then the "complete trip" returns should be positive. This indeed is not the case. So, the oft-mentioned prescription to exploit inflated shares by acquisitions,[22] and even overpay for them if needed, seems misguided on both ethical and practical grounds.[23] Goodwill write-offs, the culmination of ill-advised decisions to acquire companies with inflated shares, are thus an important business event.

VII. Some Social Costs of Acquisitions With Overpriced Shares

[22] See, for example, McKinsey on Finance (2005, p. 5): "Here are some examples of how corporate managers can take advantage of market deviations [from intrinsic value]…Paying for acquisitions with shares instead of cash when the market overprices them relative to their intrinsic value."

[23] When managers *knowingly* use inflated shares to acquire companies, they are generating a wealth transfer from new to current shareholders. Such a decision is questionable on ethical grounds.

The social costs of goodwill impairment and its frequent cause—acquisitions with overpriced shares—were not examined in the accounting (or other) literature. In closing this study we briefly examine several proxies of these social costs. Specifically, we track various indicators of economic activity by the write-off companies, before and after the write-off, to suggest social costs.[24] We then focus on employees of impaired companies to gain insight into social costs associated with ill-advised acquisitions and goodwill impairment.

Figure 3 presents the changes in the following economic activity indicators before and after goodwill write-offs: year-to-year employment growth, growth in capital expenditure, and growth in R&D expenditures. We thus consider the three major drivers of firms' and the economy-at-large growth. To avoid the undue influence of outliers, we focus in Figure 3 on the median percentage growth rates across goodwill impaired firms. We further adjust the firms' growth rates to the median growth rate in their 3-digit SIC industry in the same year. Figure 3 (top panel) indicates that the write-off firms had above-industry growth rates in all the indicators examined up to two years before the write-offs. From then on, the growth rates collapse to below-industry median, with all the costs and dislocations involved (employee layoffs, plant closing, harm to communities).[25] The three economic indicators tracked increase one year after the write-off, but still lag both the industry and the pre-write-off level (particularly in capital expenditures) even three years after the recognition of acquisition losses.

The lower panel of Figure 3 depicts the median year-to-year change in the number of business segment for the impairment firms, adjusted for the average change in the number of

[24] Kedia and Philippon (2006) apply a similar methodology to assess social costs of earnings manipulations.
[25] The fact that the various economic activity indicators turn sharply "south" two years prior to write-off, suggests that managers delay the recognition of the loss on acquisitions. Similar conclusion about write-off delays is reported by Hayn and Hughes (2006).

segments across all Compustat firms.[26] Here too, the write-off companies had above-average segment growth prior to the write-off, followed by a sharp decrease in segment growth starting two years prior to the write-off. No recovery after write-off is observed here. Thus, poor acquisition decisions culminating in goodwill write-offs cause erratic corporate behavior adversely affecting employees, customers, suppliers, and, communities.

To gain insight into employee and related economy-wide harms associated with goodwill-impaired companies, we provide in Panel A of Table 10 the annual change in the number of employees of the goodwill-impaired firms, and the impact of this change on the total number of employees in these firms.[27] The data show that during 2002-2005, the number of employees laid-off by goodwill-impaired companies was very large, ranging from 221,000 in 2005 to 540,000 in 2002. These numbers are also large relative to the total employment in those firms, ranging from -4.2% to -7.2%. Panel B compares these layoffs with the economy-at-large: total employment by non-farm companies. The left segment of the panel shows that employment at the impaired companies constituted 5%-6% of total employment in 2002-2005. However, the impact of the layoffs by impaired companies on the change in economy-wide non-farm employment was very large. In 2002 and 2003 (weak economic conditions), the layoffs by impaired companies exacerbated the overall non-form negative employment growth by 21.9% and 57.9%, respectively (right column of Panel B). Thus, almost 60% of the U.S. non-farm employment decline in 2003 came from goodwill impaired companies! In 2004-2006 (improved conditions), overall annual non-farm employment increased, but this increase was moderated by

[26] We also perform this analysis by adjusting for the average change in the number of segments across all firms in the impairment firm's three-digit SIC industry and from the same size quintile. The results of this analysis are very similar to Figure 3.

[27] Figure 3 (Panel A) indicates that the negative employment growth in the write-off year continues through the following year. Accordingly, the firm-level data in Table 10 reflect employee change in the write-off and subsequent year.

the layoffs of goodwill-impaired firms to the tune of 16.4%, 0.8%, and 10.5%, in 2004, 2005, and 2006, respectively. Thus, the employee layoffs by goodwill-impaired firms were large in absolute terms, and consequential in their economic impact, not to mention the very serious impact on the fired employees themselves. Thus, ill-advised acquisitions culminating in goodwill write-offs are definitely not a marginal economic event. They are, in fact, very consequential to investors, employees, and the economy at-large.

VIII. Concluding Comments

We hypothesize and empirically corroborate that a major root cause of goodwill write-offs is the overpriced shares of buyers at acquisition. Share overpricing provides managers with strong but often distorted incentives to acquire companies—sometimes even strategically misfit and overpaid for businesses—in order to obscure the overpricing (excess optimism) from investors and postpone, perhaps even avert, the day of reckoning (the overpricing reversal). We document that indeed overvalued companies tend to excessively engage in acquisitions, many of which are ill-advised, and these acquisitions culminate in goodwill write-offs. Effective corporate governance tempers these managerial incentives. We further show that share overpricing predicts both the occurrence of goodwill write-offs and their magnitude, a finding of importance to managers and auditors. Regarding the consequences of acquisitions with overpriced shares, we show that by and large they are a losing proposition for shareholders, and lead to considerable social costs. And despite frequent claims by managers that goodwill impairment is a non-event, a by-product of a rational use of overpriced shares, we show that it is a very consequential culmination of a vicious cycle, starting with share overpricing, leading to ill-advised acquisitions, and ending up with goodwill impairment. A losing proposition to shareholders and the economy at-large.

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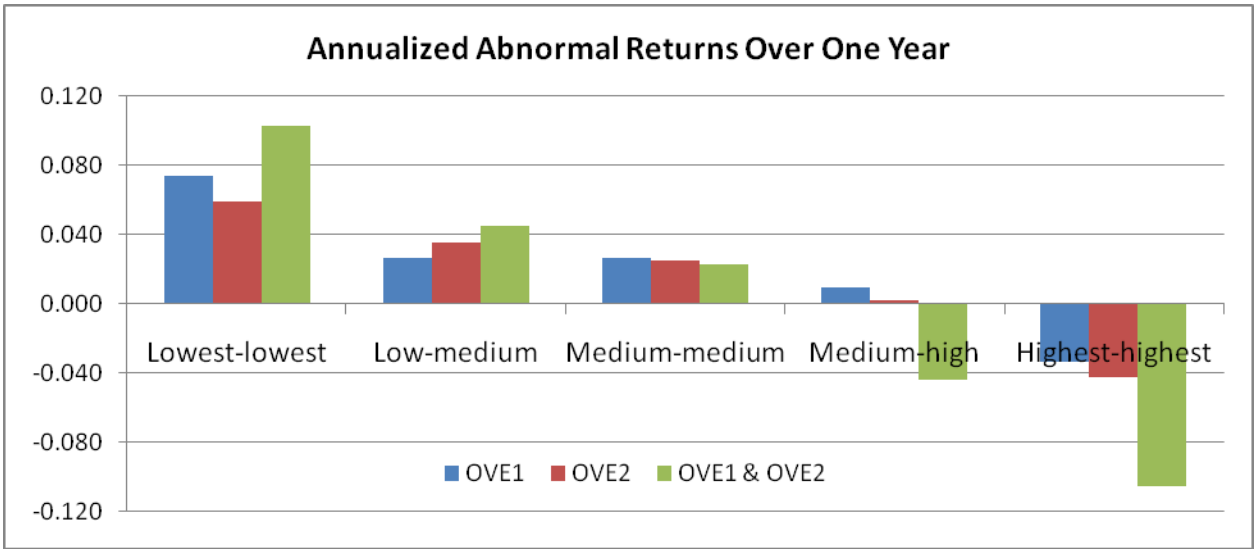
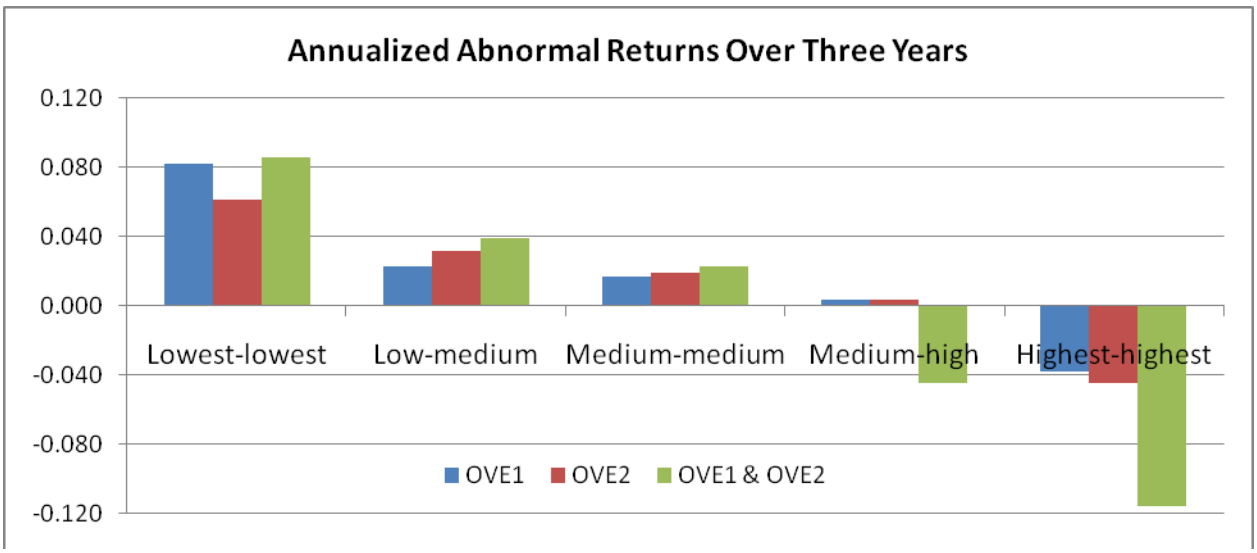
Figure 2
Subsequent Abnormal Returns for Quintile Portfolios of Firms Classified by Indicators of Mispricing





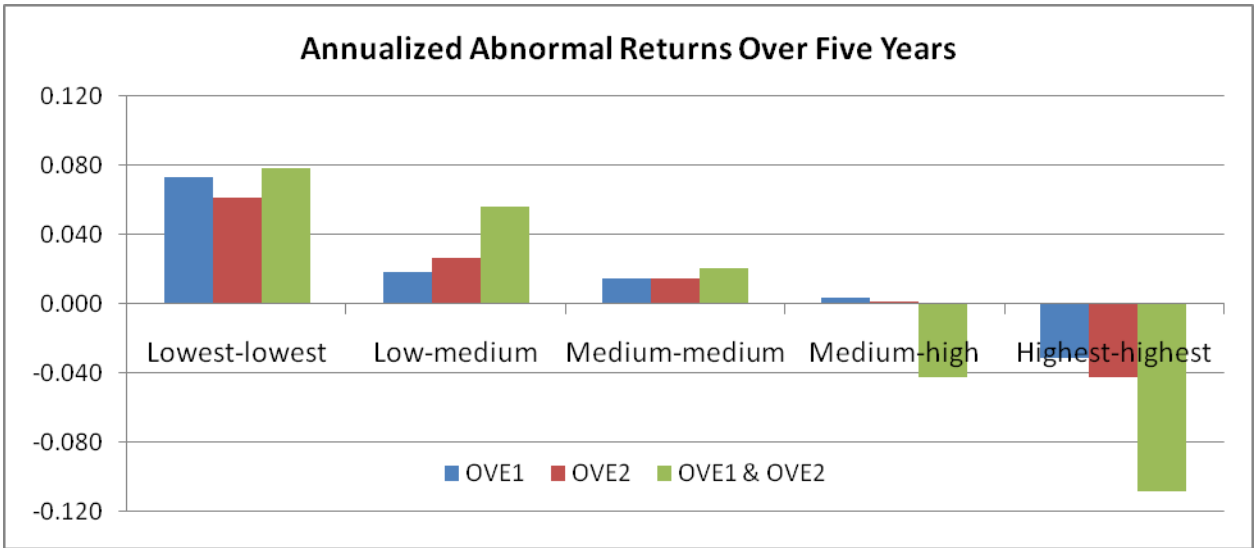
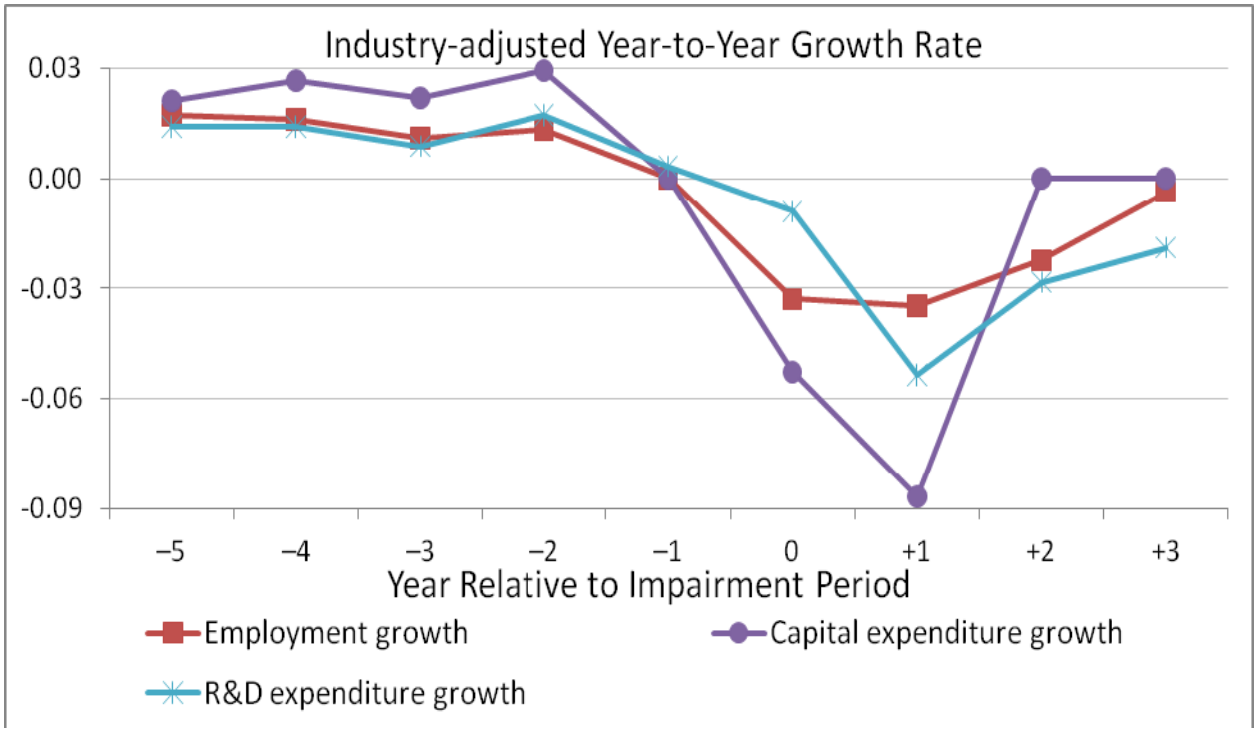


Figure 3
Changes in Economic Activities Around Goodwill Write-off



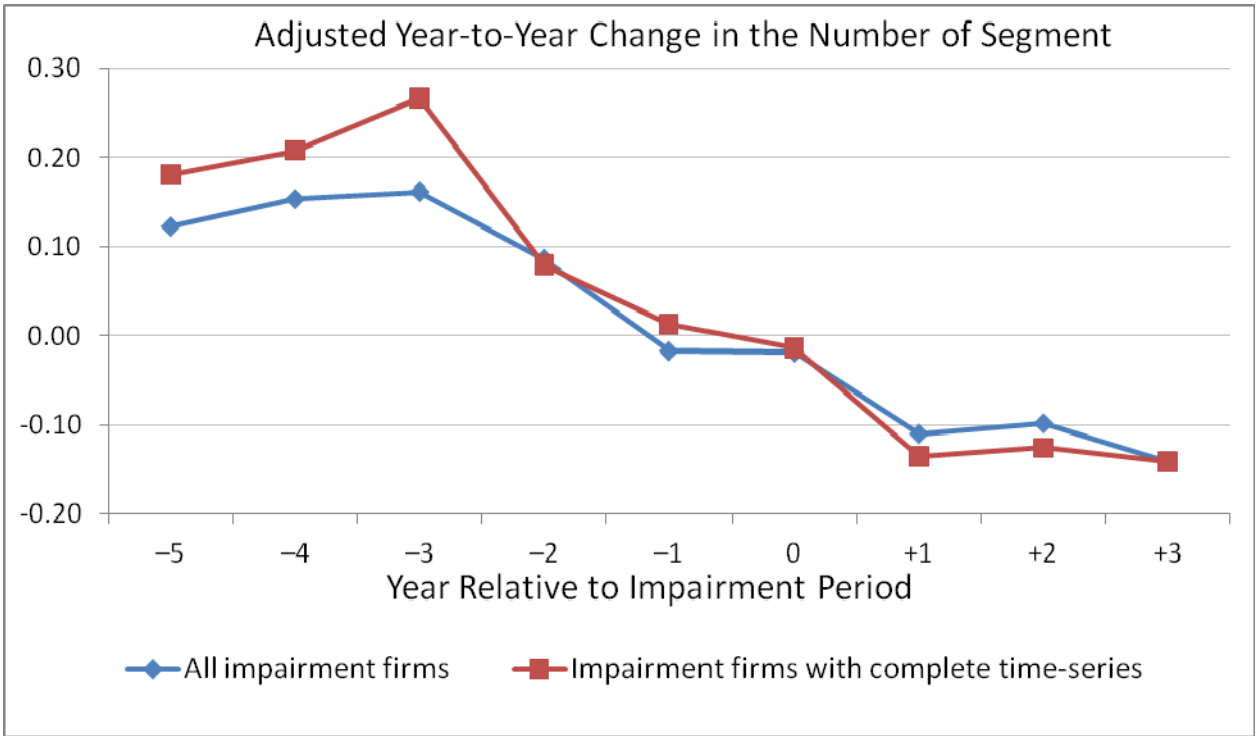


Table 1
Descriptive Statistics for Sample Firms

Panel A. All available firms

	N	Mean	Standard deviation	25%	Median	75%
Market value (*MV*) ($ million)	54,218	3135.60	14359	65.06	301.32	1311.20
Relative P/E	54,218	18.060	123.54	–3.344	0.110	7.946
Discretionary accruals	54,218	0.015	0.392	–0.032	0.002	0.042
Price momentum	54,218	0.125	0.761	–0.227	0.007	0.277
Equity issuance	54,218	0.142	0.553	0.003	0.023	0.117
Indicator #1 of overpricing (*OVE1*)	54,218	0.053	1.161	–0.384	–0.177	0.158
Indicator #2 of overpricing (*OVE2*)	54,218	0.001	0.793	–0.005	0.036	0.105
Cash flows from operation (*CFO*)	54,218	0.110	0.307	0.052	0.099	0.161

Panel B. Firms with acquisition activities

	N	Mean	Standard deviation	25%	Median	75%
Market value (*MV*) ($ million)	8,260	3417.20	14330	150.55	554.41	1846.14
Relative P/E	8,260	24.770	156.68	–2.253	1.210	10.066
Discretionary accruals	8,260	0.021	0.278	–0.026	0.004	0.041
Price momentum	8,260	0.137	0.799	–0.219	0.017	0.298
Equity issuance	8,260	0.218	0.462	0.002	0.062	0.258
Indicator #1 of overpricing (*OVE1*)	8,260	0.192	1.259	–0.327	–0.085	0.313
Indicator #2 of overpricing (*OVE2*)	8,260	–0.024	0.751	–0.052	0.033	0.096
Cash flows from operation (*CFO*)	8,260	0.116	0.135	0.059	0.108	0.169
Number of acquisitions (*NUM*)	8,260	1.392	0.983	1.000	1.000	2.000
Value of acquisitions (*VALUE*)	8,260	0.341	0.982	0.051	0.133	0.344
Percentage of stock offered (*STOCK%*)	8,260	0.215	0.359	0.000	0.000	0.433

Table 1 (Continued)
Descriptive Statistics on Sample Firms

Panel C. Future monthly abnormal stock returns of sample firms classified by quintiles of overpricing indicators (*OVE1* and *OVE2*)

Quintile	Period	Lowest-lowest	Low-medium	Medium-medium	Medium-high	Highest-highest
OVE1	One year	0.0060	0.0022	0.0022	0.0008	–0.0028
(*t*-statistics)		(5.44)	(2.47)	(2.52)	(0.77)	(–2.11)
[*p*-value]		[< 0.001]	[0.007]	[0.006]	[0.221]	[0.018]
OVE2	One year	0.0048	0.0029	0.0021	0.0002	–0.0036
		(4.89)	(2.81)	(2.44)	(0.77)	(–2.82)
		[< 0.001]	[0.003]	[0.008]	[0.221]	[0.003]
OVE1 and *OVE2*	One year	0.0082	0.0037	0.0019	–0.0037	–0.0092
		(4.91)	(3.07)	(1.92)	(–2.53)	(–4.82)
		[< 0.001]	[0.001]	[0.028]	[0.006]	[< 0.001]
OVE1	Three years	0.0066	0.0019	0.0014	0.0003	–0.0032
		(6.05)	(2.34)	(1.84)	(0.37)	(–2.87)
		[< 0.001]	[0.010]	[0.034]	[0.354]	[0.003]
OVE2	Three years	0.0050	0.0026	0.0016	0.0003	–0.0038
		(4.87)	(2.57)	(2.09)	(0.54)	(–3.36)
		[< 0.001]	[0.005]	[0.019]	[0.293]	[< 0.001]
OVE1 and *OVE2*	Three years	0.0069	0.0032	0.0019	–0.0038	–0.0102
		(4.71)	(2.61)	(1.57)	(–3.12)	(–6.65)
		[< 0.001]	[0.005]	[0.059]	[0.001]	[< 0.001]
OVE1	Five years	0.0059	0.0015	0.0012	0.0003	–0.0026
		(5.62)	(1.87)	(1.58)	(0.38)	(–2.39)
		[< 0.001]	[0.032]	[0.058]	[0.353]	[0.009]
OVE2	Five years	0.0050	0.0022	0.0012	0.0001	–0.0036
		(4.85)	(2.22)	(1.49)	(0.81)	(–3.31)
		[< 0.001]	[0.014]	[0.068]	[0.210]	[0.001]
OVE1 and *OVE2*	Five years	0.0063	0.0046	0.0017	–0.0036	–0.0095
		(4.43)	(3.92)	(1.46)	(–3.05)	(–6.66)
		[< 0.001]	[< 0.001]	[0.073]	[0.001]	[< 0.001]

Variable definitions are as follows. Market value (*MV*) (in $ millions) is the firm's capital market valuation of common equity at the fiscal year-end. Relative P/E is the difference between the firm's P/E ratio and the 4-digit SIC industry median P/E ratio for all firms in the sample firm's 4-digit SIC industry. In the computation of 4-digit industry median P/E ratio, we exclude firms with negative P/E ratios and firms with P/E ratios greater than 100. Firms with negative P/E ratios are excluded in the sample. Discretionary accruals are the difference between the firm's total accruals and "normal accruals," deflated by average total assets. Total accruals are measured as the difference between earnings before extraordinary items and cash from operation, and normal accruals are a constant proportion of the firm's current year sales, based on the ratio of the sum of total accruals to the sum of sales over the prior five years (year t–5 to year t–1) (Chan et al., 2001). Price momentum is the firm's market-adjusted returns for the 11-month period that ends one month before the firm's fiscal year-end. Equity issuance is the total amount of equities issued by the firm over the most recent three years (year t–2 to year t), deflated by lagged total assets. Indicator #1 of overpricing (*OVE1*) and indicator #2 of overpricing (*OVE2*) are, respectively, the first and second principal component of the firm's relative P/E, discretionary accruals, price momentum, and equity issuance. Cash flows from operation (*CFO*) is the amount of net cash flows from the firm's operating activities, deflated by lagged total assets. The number of acquisitions (*NUM*) is the total number of acquisition transactions undertaken by the firm in the current year. The value of acquisitions (*VALUE*) is the combined value of all acquisition transactions in the current year, deflated by the acquiring firm's market value at the beginning of the year. The percentage of stock offered (*STOCK%*) is the average percentage of the transaction value paid for by stock across all transactions in the year. In Panel C, future abnormal returns are the regression intercept of the monthly Fama-French four-factor model that accounts for the effect of market return, firm size, book-to-market, and return momentum. This model is estimated on quintile portfolios of firms classified by the values of *OVE1* and *OVE2* in year t. Firms are included into the portfolio from the beginning of the fourth month after the end of year t and remain in the portfolio for 60 months (5 years).

Table 2
Pearson (Upper Diagonal) and Spearman (Lower Diagonal) Correlation Coefficient Between Key Variables for Firms with Acquisition Activities (*p*-value for two-sided significance test in parenthesis)

	Log(MV)	*OVE1*	*OVE2*	*CFO*	*NUM*	*VALUE*	*STOCK%*
Logarithm of market value (*Log*(*MV)*)	1.000	–0.005	–0.052	0.163	0.075	–0.122	0.069
		(0.590)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Indicator #1 of overpricing (*OVE1*)	–0.020	1.000	–0.182	0.061	0.087	0.152	0.064
	(0.044)		(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Indicator #2 of overpricing (*OVE2*)	–0.045	–0.063	1.000	–0.072	–0.035	0.015	–0.018
	(0.001)	(0.001)		(0.001)	(0.001)	(0.136)	(0.078)
Cash flows from operation (*CFO*)	0.188	0.054	–0.216	1.000	–0.008	0.111	0.035
	(0.001)	(0.001)	(0.001)		(0.477)	(0.001)	(0.001)
Number of acquisitions (*NUM*)	0.101	0.096	–0.033	–0.011	1.000	0.126	0.009
	(0.001)	(0.001)	(0.001)	(0.332)		(0.001)	(0.369)
Value of acquisitions (*VALUE*)	–0.263	0.120	0.018	–0.052	0.267	1.000	0.060
	(0.001)	(0.001)	(0.068)	(0.001)	(0.001)		(0.001)
Percentage of stock offered (*STOCK%*)	0.040	0.028	–0.017	0.019	0.093	0.164	1.000
	(0.001)	(0.005)	(0.100)	(0.090)	(0.001)	(0.001)	

This table gives the Pearson (in the upper diagonal) and Spearman (in the lower diagonal) correlation coefficients among key variables for firms with acquisition activities. Variable definitions are given in the footnote to Table 1.

Table 3
The Relation between Share Overpricing and Subsequent Acquisition Activity

Panel A. Mean value (frequency) of acquisitions over the subsequent three years

		Main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2*				
Sample	**Form of payment**	**Lowest-lowest**	**Low-medium**	**Medium-medium**	**Medium-high**	**Highest-highest**
All firms	All	0.067	0.082	0.110	0.133	0.191
		(0.234)	(0.364)	(0.565)	(0.777)	(0.833)
% change of goodwill		*0.005*	*0.010*	*0.016*	*0.019*	*0.098*
Acquirers	All	0.316	0.318	0.324	0.363	0.574
		(1.549)	(1.611)	(1.834)	(2.116)	(2.508)
% change of goodwill		*0.069*	*0.072*	*0.075*	*0.081*	*0.285*
All firms	Stock	0.010	0.017	0.031	0.047	0.057
		(0.021)	(0.059)	(0.157)	(0.244)	(0.223)
Acquirers	Stock	0.342	0.366	0.374	0.395	0.542
		(1.167)	(1.283)	(1.545)	(1.804)	(2.129)
All firms	Cash	0.015	0.02	0.023	0.020	0.023
		(0.082)	(0.123)	(0.166)	(0.183)	(0.189)
Acquirers	Cash	0.238	0.215	0.174	0.158	0.183
		(1.279)	(1.324)	(1.272)	(1.421)	(1.519)
1990-1995	All	0.097	0.101	0.111	0.193	0.259
		(0.338)	(0.440)	(0.636)	(1.043)	(0.908)
1996-2000	All	0.061	0.104	0.122	0.149	0.241
		(0.227)	(0.415)	(0.639)	(0.867)	(1.081)
2001-2005	All	0.049	0.044	0.068	0.069	0.081
		(0.161)	(0.248)	(0.423)	(0.466)	(0.523)
1990-1995	Stock	0.009	0.031	0.052	0.092	0.094
		(0.025)	(0.106)	(0.273)	(0.479)	(0.283)
1996-2000	Stock	0.01	0.016	0.037	0.046	0.073
		(0.030)	(0.055)	(0.182)	(0.251)	(0.360)
2001-2005	Stock	0.010	0.005	0.003	0.011	0.008
		(0.011)	(0.021)	(0.017)	(0.039)	(0.036)
1990-1995	Cash	0.023	0.031	0.021	0.019	0.031
		(0.098)	(0.145)	(0.161)	(0.217)	(0.221)
1996-2000	Cash	0.007	0.019	0.028	0.029	0.022
		(0.054)	(0.123)	(0.169)	(0.199)	(0.188)
2001-2005	Cash	0.015	0.011	0.019	0.012	0.017
		(0.090)	(0.104)	(0.167)	(0.139)	(0.161)

Table 3 (Continued)
The Relation between Share Overpricing and Subsequent Acquisition Activity

Panel B. Logistic regression of acquisitions over the subsequent three years on indicators of overpricing, governance, and managerial ownership

	Corporate governance		Managerial ownership	
Variable	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Intercept	–2.405	[< 0.001]	–2.754	[< 0.001]
OVE1	0.268	[< 0.001]	0.222	[< 0.001]
OVE2	0.159	[< 0.009]	0.074	[< 0.012]
WEAK_GOV	0.021	[< 0.011]	——	——
MOWN%	——	——	0.028	[< 0.001]
MOWN%×MOWN%	——	——	–0.001	[< 0.001]
Log(MV)	0.122	[< 0.001]	0.155	[< 0.001]
CFO	1.439	[< 0.001]	1.104	[< 0.001]
SP500	0.324	[< 0.021]	0.472	[< 0.001]
Industry dummies	Included		Included	
Pseudo R^2	4.19%		6.91%	
Likelihood ratio	141.92		1229.62	
[*p*-value]	[< 0.001]		[< 0.001]	
N	8,291		54,218	

Panel C. Result from logistic regression for acquisitions of foreign and domestic target firms

	Foreign acquisitions		Domestic acquisitions	
Variable	**Coefficient**	***p*-value**	**Coefficient**	***p*-value**
Intercept	4.379	[< 0.001]	1.795	[< 0.001]
OVE1	0.281	[< 0.001]	0.239	[< 0.001]
OVE2	0.205	[< 0.001]	0.080	[< 0.001]
SIZE	0.221	[< 0.001]	0.088	[< 0.001]
CFO	0.287	[< 0.010]	0.688	[< 0.001]
SP500	0.305	[< 0.015]	0.536	[< 0.001]
Industry dummies	Included		Included	
Pseudo R^2	7.50%		6.91%	
Likelihood Ratio	758.08		668.09	
[*p*-value]	[< 0.001]		[< 0.001]	
N	54,218		54,218	

Table 3 (Continued)
The Relation between Share Overpricing and Subsequent Acquisition Activity

Panel D. Results from OLS regression of total acquisition value over the subsequent three years on indicators of overpricing and control variables

	All acquisitions	Stock-only acquisitions	Cash-only acquisitions
Variable	**Model 1**	**Model 2**	**Model 3**
Intercept	0.625	0.595	0.556
(*t*-statistics)	(26.46)	(9.59)	(13.29)
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]
OVE1	0.034	0.030	–0.007
	(4.59)	(1.91)	(–0.91)
	[< 0.001]	[0.028]	[0.181]
OVE2	0.043	0.057	–0.028
	(3.33)	(2.18)	(–1.31)
	[< 0.001]	[0.015]	[0.101]
Log(MV)	–0.045	–0.037	–0.052
	(–13.83)	(–4.30)	(–10.11)
	[< 0.001]	[< 0.001]	[< 0.001]
CFO	–0.172	–0.173	–0.165
	(–3.12)	(–1.51)	(–2.28)
	[0.001]	[0.066]	[< 0.001]
SP500	0.123	–0.114	0.055
	(5.07)	(–1.46)	(2.10)
	[< 0.001]	[0.072]	[0.018]
Industry dummies	Included	Included	Included
Adjusted R^2	8.11%	9.66%	11.27%
F-statistics	18.26	5.52	5.91
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]
N	14,477	2,821	5,704

Table 3 (Continued)
The Relation between Share Overpricing and Subsequent Acquisition Activity

Panel E. Results from OLS regression of changes in goodwill relative to total assets over the subsequent three years on indicators of overpricing and control variables

Variable	All firms Model 1	Acquirers Model 2	Acquirers with goodwill Model 3
Intercept	0.011	0.079	0.189
(*t*-statistics)	(4.69)	(9.36)	(14.02)
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]
OVE1	0.012	0.018	0.049
	(8.48)	(5.95)	(10.82)
	[< 0.001]	[< 0.001]	[< 0.001]
OVE2	0.001	0.010	0.022
	(0.29)	(2.17)	(2.83)
	[0.385]	[0.015]	[0.002]
STOCK%	0.001	0.0004	0.001
	(19.66)	(5.44)	(6.28)
	[< 0.001]	[< 0.001]	[< 0.001]
Log(MV)	–0.002	–0.002	–0.008
	(–5.67)	(–1.33)	(–3.99)
	[< 0.001]	[0.091]	[< 0.001]
CFO	–0.070	–0.111	–0.286
	(–8.37)	(–4.86)	(–7.80)
	[< 0.001]	[< 0.001]	[< 0.001]
SP500	0.016	0.074	0.043
	(5.07)	(6.18)	(2.76)
	[< 0.001]	[< 0.001]	[0.003]
Industry dummies	Included	Included	Included
Adjusted R^2	6.69%	5.29%	12.65%
F-statistics	93.03	18.60	33.06
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]
N	54,218	14,477	7,652

In panel A, the main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2* are formed by assigning firms in each year into quintile portfolios ranked by the values of *OVE1* and *OVE2*, respectively, and then retaining firms in the intersection of the two portfolios. For example, the portfolio labeled "Highest-highest" ("Lowest-lowest") consists of firms that are in the top (bottom) quintiles ranked by both *OVE1* and *OVE2*. "All firms" include all firms with data on *OVE1* and *OVE2*, and "Acquirers" include only those with acquisition activities. "Stock" includes firms with acquisitions that are completely paid with the shares of the acquiring firm, and "Cash" includes firms with acquisitions that are fully paid with cash. The logistic regressions in panel B include the decision of acquisition (1 for acquiring firms and 0 for non-acquiring firms) as the dependent variable. The definitions of *OVE1*, *OVE2*, *MV*, and *CFO* are as given in the footnote to Table 1. *SP500* is the return on the Standard & Poor 500 Index. *WEAK_GOV* is the corporate governance quality index developed by Gompers, Ishii, and Metrick (2003). *MOWN%* in is the percentage of shares owned by all managers with at least 1% of ownership of the firm-year as identified in the Execucomp database. *MOWN%*×*MOWN%* equals *MOWN%* times *MOWN%*. In Panel C, the dependent variables of the logistic regressions are the decision to acquire a foreign target firm and the decision to acquire a domestic target firm, respectively. In Panel E, the dependent variable is the change in the firm's goodwill relative to total assets from year *t* to year *t*+3. *STOCK%* is the average percentage of transaction value acquired with stock in all acquisitions over the subsequent three years. The standard error estimates in the OLS regressions of panels D and E are obtained by following the firm-level clustering procedure of Peterson (2006).

Table 4
Future Five-Year Abnormal Stock Performance (Post-Acquisition) for Firms with Acquisitions

Panel A. Estimates of future abnormal returns for all acquisitions, stock-only acquisitions, and cash-only acquisitions

Acquisition type	Acquisition year	Future abnormal monthly return	*t*-statistic	*p*-value
All acquisitions	$t + 1$	–0.0024	–2.35	0.010
Stock-only acquisitions	$t + 1$	–0.0045	–2.41	0.008
Cash-only acquisitions	$t + 1$	0.0005	0.24	0.406
All acquisitions	$t + 2$	–0.0028	–2.78	0.003
Stock-only acquisitions	$t + 2$	–0.0036	–2.76	0.003
Cash-only acquisitions	$t + 2$	–0.0028	–1.87	0.032
All acquisitions	$t + 3$	–0.0021	–1.91	0.029
Stock-only acquisitions	$t + 3$	–0.0032	–2.37	0.009
Cash-only acquisitions	$t + 3$	–0.0013	–0.79	0.214
All acquisitions	*t+1, t+2, t+3*	–0.0025	–2.98	0.002
Stock-only acquisitions	*t+1, t+2, t+3*	–0.0039	–3.13	0.001
Cash-only acquisitions	*t+1, t+2, t+3*	–0.0017	–1.19	0.118

Table 4 (Continued)
Future Five-Year Stock Performance (Post-Acquisition) for Firms with Acquisition Activities

Panel B. Estimate of future abnormal returns for sub-sample partitioned by quintiles of overpricing

	Main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2*				
Acquisition type (year)	**Lowest-lowest**	**Low-medium**	**Medium-medium**	**Medium-high**	**Highest-highest**
All acquisitions (*t*+1)	0.0047	0.0003	0.0001	–0.0052	–0.0103
(*t*-statistics)	(1.94)	(0.18)	(0.04)	(–2.34)	(–5.31)
[*p*-value]	[0.027]	[0.430]	[0.484]	[0.010]	[< 0.001]
Stock-only acquisitions (*t*+1)	0.0027	0.0002	0.0002	–0.0054	–0.0127
	(0.70)	(0.08)	(0.07)	(–1.58)	(–4.15)
	[0.242]	[0.467]	[0.474]	[0.058]	[< 0.001]
Cash-only acquisitions (*t*+1)	0.0007	0.0009	–0.0003	–0.0004	–0.0047
	(0.19)	(0.59)	(–0.11)	(–0.19)	(–1.72)
	[0.424]	[0.276]	[0.455]	[0.426]	[0.044]
All Acquisitions (*t*+2)	0.0044	0.0012	0.0011	–0.0050	–0.0081
	(2.39)	(0.44)	(0.63)	(–2.22)	(–4.03)
	[0.009]	[0.329]	[0.263]	[0.014]	[< 0.001]
Stock-only acquisitions (*t*+2)	0.0043	0.0004	–0.0010	–0.0064	–0.0122
	(1.05)	(0.12)	(–0.46)	(–2.17)	(–3.22)
	[0.148]	[0.453]	[0.324]	[0.016]	[0.001]
Cash-only acquisitions (*t*+2)	0.0028	0.0026	0.0008	–0.0034	–0.0069
	(1.37)	(1.29)	[0.33]	(–0.88)	(–2.18)
	[0.087]	[0.100]	[0.370]	[0.190]	[0.015]
All Acquisitions (*t*+3)	0.0064	0.0017	–0.0007	–0.0039	–0.0071
	(2.31)	(0.58)	(–0.33)	(–1.52)	(–3.81)
	[0.011]	[0.282]	[0.369]	[0.066]	[< 0.001]
Stock-only acquisitions (*t*+3)	0.0011	0.0005	–0.0015	–0.0029	–0.0052
	(0.21)	(0.20)	(–0.61)	(–1.05)	(–1.71)
	[0.417]	[0.420]	[0.271]	[0.148]	[0.045]
Cash-only acquisitions (*t*+3)	0.0064	0.0004	–0.0025	0.0040	–0.0072
	(1.54)	(0.19)	(–1.14)	(–0.97)	(–2.24)
	[0.063]	[0.425]	[0.128]	[0.166]	[0.013]

Future abnormal returns reported in this table are the regression intercept of the monthly Fama-French four-factor model that accounts for the effect of market return, firm size, book-to-market, and return momentum. This model is estimated on portfolios consisting of firms with acquisition activities one year (t+1), two years (t+2), and three years (t+3), respectively, after the measurement of share over-pricing (i.e., the measurement date of *OVE1* and *OVE2*) in year t. Firms are included into the portfolio from the month after the acquisition and remain in the portfolio for 60 months (5 years). The procedure for assigning firms into the main diagonal portfolios classified by the quintiles of *OVE1* and *OVE2* is given in the footnote to Table 3.

Table 5
The Relation between Acquisition Activities and Future Five-Year Stock Abnormal Returns

	Main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2*				
Sample	**Lowest-lowest**	**Low-medium**	**Medium-medium**	**Medium-high**	**Highest-highest**
Panel A. Classification based on acquisitions in the subsequent year (year *t*+1)					
(A1) Firms with NO acquisitions in year *t*+1					
Average monthly abnormal return over 5-year period	0.0064	0.0033	0.0021	–0.0004	–0.0113
(*t*-statistics)	(4.39)	(2.23)	(1.82)	(–0.36)	(–6.91)
[*p*-value]	[< 0.001]	[0.013]	[0.035]	[0.360]	[< 0.001]
Mean *OVE1*, mean *OVE2*	–0.60, –0.27	–0.34, –0.02	–0.20, 0.03	0.03, 0.08	1.14, 0.42
[Median *OVE1*, median *OVE2*]	[–0.57, –0.14]	[–0.34, –0.01]	[–0.20, 0.04]	[0.03, 0.08]	[0.71, 0.25]
(A2) Firms with acquisitions in year *t*+1					
Average monthly abnormal return over 5-year period	0.0038	0.0018	0.0007	–0.0063	–0.0162
(*t*-statistics)	(1.23)	(0.78)	(0.32)	(–1.73)	(–5.72)
[*p*-value]	[0.111]	[0.219]	[0.375]	[0.043]	[< 0.001]
Mean *OVE1*, mean *OVE2*	–0.59, –0.18	–0.34, –0.01	–0.21, 0.04	0.03, 0.08	1.21, 0.43
[Median *OVE1*, median *OVE2*]	[–0.61, –0.13]	[–0.32, –0.01]	[–0.21, 0.04]	[0.03, 0.08]	[0.79, 0.23]
Difference between firms in (A2) and firms in (A1)					
Difference in average monthly abnormal return	–0.0026	–0.0015	–0.0014	–0.0059	–0.0049
(*t*-statistics)	(–1.50)	(–1.23)	(–1.54)	(–1.38)	(–2.98)
[*p*-value]	[0.066]	[0.110]	[0.063]	[0.085]	[0.002]
Difference in mean *OVE1*, difference in mean *OVE2*	0.01, 0.09	0.00, 0.01	–0.01, 0.01	0.00, 0.00	0.07, 0.01
[Difference in median *OVE1*, difference in median *OVE2*]	[–0.04, 0.01]	[0.02, 0.00]	[–0.01, 0.00]	[0.00, 0.00]	[0.08, –0.02]

Table 5 (Continued)
The Relation between Acquisition Activities and Future Five-Year Stock Performance

Sample	Main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2*: Lowest-lowest	Low-medium	Medium-medium	Medium-high	Highest-highest
Panel B. Classification based on corporate governance quality of firms with acquisitions in the subsequent year (year *t*+1)					
(B1) Firms with weak corporate governance in year *t*+1					
Average monthly abnormal return over 5-year period	0.0025	0.0023	–0.0036	–0.0041	–0.0189
(*t*-statistics)	(0.43)	(0.92)	(–1.49)	(–2.32)	(–4.42)
[*p*-value]	[0.333]	[0.179]	[0.069]	[0.011]	[< 0.001]
Mean *OVE1*, mean *OVE2*	–0.60, –0.18	–0.34, 0.00	–0.23, 0.04	0.02, 0.08	0.53, 0.52
[Median *OVE1*, median *OVE2*]	[–0.62, –0.15]	[–0.31, 0.01]	[–0.25, 0.04]	[0.02, 0.08]	[0.41, 0.23]
(B2) Firms with strong corporate governance in year *t*+1					
Average monthly abnormal return over 5-year period	0.0007	0.0036	0.0021	–0.0013	–0.0051
(*t*-statistics)	(0.08)	(0.62)	(0.41)	(–0.91)	(0.86)
[*p*-value]	[0.467]	[0.269]	[0.341]	[0.183]	[0.196]
Mean *OVE1*, mean *OVE2*	–0.66, –0.14	–0.34, –0.01	–0.28, 0.03	0.02, 0.08	0.52, 0.37
[Median *OVE1*, median *OVE2*]	[–0.62, –0.14]	[–0.30, –0.01]	[–0.28, 0.03]	[–0.01, 0.09]	[0.52, 0.28]
Difference between firms in (B1) and firms in (B2)					
Difference in average monthly abnormal return	0.0018	–0.0013	–0.0057	–0.0028	–0.0138
(*t*-statistics)	(0.16)	(–0.34)	(–0.99)	(–1.33)	(–2.86)
[*p*-value]	[0.437]	[0.367]	[0.162]	[0.093]	[0.003]
Difference in mean *OVE1*, difference in mean *OVE2*	0.06, –0.04	0.00, 0.01	0.05, 0.01	0.00, 0.00	0.01, 0.15
[Difference in median *OVE1*, difference in median *OVE2*]	[0.00, –0.01]	[–0.01, 0.02]	[0.03, 0.01]	[0.03, –0.01]	[–0.09, –0.05]

Future abnormal returns reported in this table are the intercept of the monthly Fama-French four-factor model that accounts for the effect of market return, firm size, book-to-market, and return momentum. This model is estimated on portfolios consisting of firms with acquisition activities in year t+1, the year subsequent to the year for which share overpricing is measured (i.e., the measurement year of *OVE1* and *OVE2*). The 60-month (5 years) return period starts from the beginning of the fourth month of year t+1. The procedure for assigning firms into the main diagonal portfolios classified by the quintiles of *OVE1* and *OVE2* is given in the footnote to Table 3. Data on corporate governance quality is obtained from Gompers, Ishii, and Metrick (2003).

Table 6
The Relation between Share Overpricing/Acquisition and Future Profitability

Panel A. Descriptive statistics of average profitability before and after acquisition

Period/variable	Non-acquirers	Acquirers	Acquirers with no future impairment	Acquirers with future impairment
Average profitability before acquisition (*PROA*):				
Mean	0.0142	0.0181	0.0178	0.0191
Difference	0.0039		0.0013	
(*p*-value)	(0.005)		(0.672)	
Median	0.0087	0.0099	0.0091	0.0134
Difference	0.0012		0.0043	
(*p*-value)	(< 0.001)		(0.188)	
Average profitability after acquisition (*FROA*):				
Mean	0.0012	–0.0002	0.0025	–0.0086
Difference	–0.0014		–0.0111	
(*p*-value)	(0.367)		(< 0.001)	
Median	0.0036	0.0034	0.0040	0.0004
Difference	–0.0002		–0.0036	
(*p*-value)	(0.023)		(< 0.001)	

Panel B. Results from regression of post-acquisition profitability (*FROA*)

Variable	All firms	Acquirers	Acquirers with no future impairment	Acquirers with future impairment
Intercept	–0.004	–0.002	0.002	–0.013
(*t*-statistics)	(–4.20)	(–1.64)	(1.30)	(–4.86)
[*p*-value]	[< 0.001]	[0.101]	[0.192]	[< 0.001]
NUM	–0.266	–0.107	–0.095	–0.521
	(–3.59)	(–2.61)	(–2.23)	(–3.99)
	[< 0.001]	[0.005]	[0.013]	[< 0.001]
OVE1	–0.001	–0.004	–0.004	–0.006
	(–1.30)	(–4.04)	(–3.34)	(–2.87)
	[0.097]	[< 0.001]	[< 0.001]	[0.002]
OVE2	–0.004	–0.005	–0.006	0.001
	(–1.93)	(–1.99)	(–2.32)	(0.33)
	[0.027]	[0.023]	[0.010]	[0.372]
PROA	0.336	0.179	0.169	0.241
	(11.39)	(9.34)	(7.14)	(7.49)
	[< 0.001]	[< 0.001]	[< 0.001]	[< 0.001]
Fixed year effects	Included	Included	Included	Included
Adj. R^2	13.95%	10.33%	9.22%	22.70%
F-statistics	323.18	34.36	23.37	21.31
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]	[< 0.001]
N	23,859	3,477	2,645	831

The dependent variable of the regressions, *FROA*, is the firm's average return on assets before the effect of goodwill impairment write-offs over years t+4, t+5, and t+6 after acquisition in year t. *NUM* is the number of acquisitions in year t (deflated by lagged total assets). The definitions of *OVE1* and *OVE2* are as given in the footnote to Table 1. *PROA* is the firm's average return on assets before impairment write-offs over years t–2 and t–1 before acquisition in year t. Past and future return on assets is adjusted for the firm's 4-digit SIC industry average of the same year. Following Petersen (2006), we run all regressions with year dummies included and report the significance level of coefficient estimate obtained from firm level clustering.

Table 7
The Relation Between Share Overpricing and Subsequent Goodwill Impairment and Acquisition-Related Lawsuits

Panel A. Mean amount of goodwill write-offs in 2001-2006 and percentage of firms involved in acquisition-related lawsuits for portfolios formed by indicators of overpricing

	Main diagonal of sample firms classified by quintiles of *OVE1* and *OVE2*				
Sample description	**Lowest-lowest**	**Low-medium**	**Medium-medium**	**Medium-high**	**Highest-highest**
1) Mean amount of goodwill write-offs for all firms with data on share overpricing	0.0033	0.0051	0.0060	0.0118	0.0206
2) Mean amount of goodwill write-offs for all firms with non-zero impairment over 2001-2006	0.0284	0.0289	0.0424	0.0757	0.1012
3) Mean amount of goodwill write-offs for firms with acquisitions activities over 1991-2000	0.0032	0.0060	0.0111	0.0212	0.0338
4) Mean amount of goodwill write-offs for firms with acquisitions activities over 1991-2000 and impairment over 2001-2006	0.0225	0.0270	0.0603	0.1046	0.1367
5) Percentage of firms sued for using inflated stock as a currency in acquisitions over 1996-2006.	0.00%	4.74%	6.30%	7.84%	14.29%
6) Percentage of acquiring firms sued for using inflated stock as a currency in acquisitions, and reporting goodwill write-offs in 2001-2006.	0.00%	7.14%	18.18%	33.33%	43.75%

Table 7 (Continued)
The Relation between Share Overpricing/Acquisition and Future Goodwill Impairment and Acquisition-related Lawsuits

Panel B. Results from the regression of future goodwill impairment write-off

	Model 1	**Model 2**	**Model 3**	**Model 4**
Sample (regression type)	Firms with acquisition (Tobit)	All firms (Tobit)	Firms with acquisition (Tobit)	Firms with impairment (OLS)
Intercept	–0.1861	–0.1731	–0.1224	0.0672
(*t*-statistics)	(–12.79)	(–7.27)	(–4.87)	(6.42)
[*p*-value]	[< 0.001]	[< 0.001]	[< 0.001]	[< 0.001]
OVE1	0.0102	0.0269	0.0208	0.0300
	(3.16)	(5.50)	(4.35)	(6.86)
	[0.001]	[< 0.001]	[< 0.001]	[< 0.001]
OVE2	0.0165	0.0281	0.0197	0.0325
	(2.18)	(3.43)	(2.59)	(3.98)
	[0.015]	[0.001]	[0.005]	[< 0.001]
STOCK%	0.0008	———	0.0004	———
	(0.07)		(0.29)	
	[0.472]		[0.386]	
FOREIGN%	0.0204	———	0.0129	———
	(1.66)		(0.79)	
	[0.049]		[0.215]	
WEAK_GOV	———	0.0033	0.0024	———
		(2.50)	(1.96)	
		[0.065]	[0.025]	
TRANSITION	0.2277	0.2201	0.1949	0.0279
	(4.35)	(3.92)	(4.65)	(3.91)
	[< 0.001]	[< 0.001]	[< 0.001]	[< 0.001]
Log(MV)	0.0047	0.0004	–0.0034	–0.0044
	(2.46)	(0.02)	(1.22)	(–2.97)
	[0.007]	[0.493]	[0.112]	[0.002]
Industry dummies	Included	Included	Included	Included
F-statistics	———	———	———	16.47
[*p*-value]				[< 0.0001]
Log likelihood	–86.96	–247.35	–162.34	———
Chi-square	683.89	105.82	99.03	
[*p*-value]	[< 0.0001]	[< 0.0001]	[< 0.0001]	
Pseudo R^2 [Adj. R^2]	19.73%	16.48%	10.06%	[16.62%]
N	2,136	1,740	1,160	777

Table 7 (Continued)
The Relation between Share Overpricing/Acquisition and Future Goodwill Impairment and Acquisition-related Lawsuits

Panel C. Logistic regression of future incidences of acquisition-related lawsuit on indicators of overpricing and control variables

Variable	Coefficient estimate	*z*-statistics	*p*-value
Intercept	–4.064	–12.13	< 0.001
OVE1	0.473	7.14	< 0.001
OVE2	0.310	2.73	0.003
Log(MV)	0.185	4.78	< 0.001
HIGH_TECH	0.328	2.02	0.022
Year dummies	Included		
Model χ^2	103.68		
Model *p*-value	< 0.001		
Pseudo R^2	9.67%		
N	3,231		

For each firm, we measure share overpricing by the average value of the two indicators of overpricing (*OVE1* and *OVE2*) over 1990-2000. Goodwill write-offs are based on the total amount of write-offs during 2001-2006. The procedure for assigning firms into the main diagonal portfolios classified by the quintiles of average *OVE1* and *OVE2* is similar to the one given in the footnote to Table 3, with the definitions of *OVE1* and *OVE2* for a firm-year given in the footnote to Table 1. In Panel B, *STOCK%* is the average percentage of acquisition value paid with stock across all acquisitions over 1990-2000. *FOREIGN%* is the average percentage of foreign acquisitions made by the firm. Data on corporate governance quality (*WEAK_GOV*) is obtained from Gompers, Ishii, and Metrick (2003). *TRANSITION* is a dummy variable that takes the value of 1 for firms reporting goodwill impairment in 2001 and 2002 and 0 otherwise. *Log(MV)* is the logarithm of the firm's market value. The sample for "Firms with acquisition" in Model 1 (Tobit) includes firms with acquisitions during 1990-2000 and with data on *OVE1* and *OVE2*. The sample for "All firms" in Model 2 (Tobit) includes all available firms with data on *OVE1*, *OVE2*, and the corporate governance quality measure (*WEAK_GOV*) of Gompers, Ishii, and Metrick (2003). The sample for "Firms with acquisition" in Model 3 (Tobit) includes firms used in the regression of Model 1 that have the corporate governance quality measure (*WEAK_GOV*) of Gompers, Ishii, and Metrick (2003). The sample for "Firms with impairment" in Model 4 (OLS) includes firms that report goodwill impairment during 2001-2006 and have data on *OVE1* and *OVE2* over prior years. In Panels A and C, information on acquisition-related lawsuits is obtained from Stanford University's securities litigation database from 1995 to 2006. *HIGH_TECH* is a dummy variable that takes the value of 1 for firms from biotech, computer, electronics, instruments, telecom, and software industries and 0 otherwise.

Table 8
The Usefulness of Share Overpricing/Acquisition in Predicting Goodwill Impairment of Future Years

Panel A. Logistic regression predicting impairment vs. no-impairment

Independent variable	Coefficient estimate	*z*-statistics	*p*-value	Effect on probability
Intercept	–0.769	–11.58	< 0.001	———
OVE1	0.778	8.81	< 0.001	19.33%
OVE2	0.587	3.10	0.001	14.97%
STOCK%	0.013	11.47	< 0.001	0.32%
Log(NUM)	0.205	2.08	0.019	5.12%
VALUE	–0.141	–1.92	0.028	–3.53%
FOREIGN%	0.167	1.58	0.058	4.18%
GOODWILL	1.642	9.20	< 0.001	41.01%
Log(MV)	–0.032	–1.61	0.054	–0.80%
3-digit SIC Industry Dummies	Included			
Model χ^2 (Model *p*-value)		552.36 (< 0.001)		
Pseudo R^2		11.14%		
% correctly classified (% no-impairment in sample)		66.11% (55.79%)		
Actual impairment (actual no-impairment) predicted to be true		52.16% (77.17%)		
Type I (type II) error		22.83% (47.84%)		

Panel B. Tobit regression predicting the amount of impairment vs. no-impairment

Independent variable	Coefficient estimate	*t*-statistics	*p*-value	Effect on probability
Intercept	–0.118	–5.49	< 0.001	———
OVE1	0.119	16.81	< 0.001	16.03%
OVE2	0.051	3.85	< 0.001	6.82%
STOCK%	0.001	8.84	< 0.001	0.18%
Log(NUM)	0.029	2.02	0.022	3.87%
VALUE	–0.017	–1.85	0.032	–2.35%
FOREIGN%	0.036	2.29	0.011	4.91%
GOODWILL	0.046	9.92	< 0.001	6.19%
Log(MV)	–0.007	–2.52	0.006	–0.99%
3-digit SIC Industry Dummies	Included			
Model χ^2 (Model *p*-value)		774.16 (< 0.001)		
Pseudo R^2		25.08%		

The definitions of *OVE1*, *OVE2*, *STOCK%*, *NUM*, *VALUE*, and *MV* are as given in the footnote to Table 1. *FOREIGN%* is the percentage of foreign acquisitions made by the firm in a given year and ranges between 0 and 100%. *GOODWILL* is the amount of goodwill relative to the firm's total assets. The dependent variable in the logistic regression of Panel A takes the value of 1 for firms reporting impairment in the subsequent year and 0 otherwise. The dependent variable in the tobit regression of Panel B takes the value of the actual amount of goodwill impairment relative to the firm's total assets for firms with goodwill impairment in subsequent years and 0 for no-impairment firms. The sample for both regressions consists of firms with acquisition activities in the year of measuring share overpricing.

Table 9
Mean and Median Firm Performance around Acquisition and Goodwill Write-off

Panel A. Benchmark: acquiring firms with no impairment (1953 firms)

	Years relative to acquisition								Total return
Variable	**–1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**	**+6**	**since acquisition**
Excess stock return	0.0438	0.0242	0.0601	0.0563	–0.0110	0.0617	0.0128	0.0714	0.3881
	–0.0215	–0.0046	–0.0102	0.0633	0.0292	0.0651	–0.0132	0.0717	0.1942
Return on assets	–0.0170	–0.0337	–0.0323	–0.0364	–0.0331	–0.0309	–0.0325	–0.0345	
	0.0083	0.0053	0.0034	0.0019	0.0019	0.0014	0.0012	0.0016	——

Panel B. Firms that survived up to three years after impairment (404 firms)

	Years relative to acquisition			Years relative to impairment					Total return
Variable	**–1**	**0**	**+1**	**–1**	**0**	**+1**	**+2**	**+3**	**since acquisition**
Excess stock return	0.0400	0.1211	–0.1197	0.0294	–0.2590	–0.0260	0.0772	–0.0388	–0.3164
	–0.1249	0.0608	–0.1575	–0.0280	–0.3745	–0.0723	–0.0147	–0.0710	–0.4275
Return on assets	–0.0797	–0.0642	–0.0808	–0.0713	–0.1214	–0.1259	–0.0967	–0.1021	
	0.0041	–0.0003	–0.0020	–0.0077	–0.0304	–0.0220	–0.0229	–0.0168	——

Panel C. Firms that survived up to only two years after impairment (18 firms)

Excess stock return	0.4634	2.3665	–0.4839	–0.4412	0.1979	0.4263	–0.3107		–1.0457
	0.2362	–0.1932	–0.5010	–0.5808	0.0151	0.1132	–0.4215	——	–0.8942
Return on assets	–0.0401	–0.0636	–0.1348	–0.0555	–0.1352	–0.0928	–0.1336		
	0.0102	–0.0113	–0.0595	–0.0458	–0.0881	–0.0472	–0.0813	——	——

Table 9 (Continued)
Mean and Median Firm Performance around Acquisition and Goodwill Write-off

	Years relative to acquisition			Years relative to impairment					Total return
Variable	**–1**	**0**	**+1**	**–1**	**0**	**+1**	**+2**	**+3**	**since acquisition**
Panel D. Firms that survived up to only one year after impairment (37 firms)									
Excess stock return	–0.0911	–0.0666	–0.0363	–0.0317	–0.1411	–0.1293			–1.8873
	–0.0741	0.0729	–0.1475	–0.0095	–0.1319	–0.1227	——	——	–2.1263
Return on assets	–0.1047	–0.1000	–0.1829	–0.1809	–0.4252	–0.4638			
	–0.0033	–0.0173	–0.0352	–0.0600	–0.1786	–0.1613	——	——	——
Panel E. Firms that did not survive after impairment (45 firms)									
Excess stock return	–0.1245	–0.0327	–0.4565	–0.3764	–0.3651				–1.0049
	–0.1178	–0.1722	–0.5325	–0.4857	–0.4430	——	——	——	–0.9954
Return on assets	–2.0452	–0.1493	–0.1664	–0.1850	–0.2789				
	–0.0062	–0.0298	–0.0626	–0.0871	–0.1806	——	——	——	——
Panel F. All firms with impairment (504 firms)									
Excess stock return	0.0360	0.1295	–0.1285	0.0239	–0.2568				–0.2171
	–0.1249	0.0608	–0.1575	–0.0280	–0.3745	——	——	——	–0.3835
Return on assets	–0.2587	–0.0744	–0.0974	–0.0889	–0.1583				
	0.0037	–0.0038	–0.0050	–0.0160	–0.0557	——	——	——	——

The first (second) row for each variable reports the mean (median) value of that variable. Sample firms included in this table have acquisition activities identified in the SDC database and report goodwill impairment over 2001-2006. The sample in panel A consists of 404 firms that report goodwill impairment over 2001-2003 and have the required Compustat data available for up to three years after the impairment. The sample in panel B consists of 18 firms that report goodwill impairment over 2001-2003 but no longer have the required Compustat data available in two years after the impairment. The sample in panel C consists of 37 firms that report goodwill impairment over 2001-2004 but no longer have the required Compustat data available in one year after the impairment. The sample in panel D consists of 45 firms that report goodwill impairment over 2001-2005 but no longer on Compustat after the impairment year. Excess stock returns are the firm's stock returns minus the market return of the same period. Return on assets is before the effect of goodwill impairment and is adjusted for the firm's 4-digit SIC industry average return on assets.

Table 10
Level and Change of Employment at Firms with Goodwill Impairment

Panel A. Number of employees laid off by firms with goodwill impairment in the current year and subsequent year of impairment (in thousands))

Year	Number of firms with impairment	Change in the number of employees	Percentage change, total employees
2001	322	–55	–1.71%
2002	468	–540	–7.24%
2003	320	–471	–7.09%
2004	288	–225	–3.35%
2005	283	–221	–4.19%
2006	303	–83	–1.71%
Total	1984	–1,595	–4.67%

Panel B. Level and change of employment at firms goodwill impairment relative to total non-farm payroll (in million)

	Level of employment			Change in employment		
Year	Firms with impairment	Non-farm payroll	Percentage	Firms with impairment	Non-farm payroll	Percentage
2001	3.705	132.047	2.81%	——	——	——
2002	7.881	130.373	6.04%	–0.366	–1.674	21.86%
2003	6.639	129.839	5.11%	–0.309	–0.534	57.87%
2004	6.959	131.414	5.30%	–0.259	1.575	(16.44%)
2005	6.935	133.574	5.19%	–0.018	2.160	(0.83%)
2006	5.041	135.910	3.71%	–0.244	2.336	(10.45%)
Mean	6.193	132.193	4.69%	–0.239	0.773	(30.94%)

Panel A and Panel B include firms that report goodwill impairment in 2001–2006 and have data on the number of employees in the current year and subsequent year. In Panel A, the change in the number of employees is measured for the impairment year and subsequent year, and the percentage change in the number of employees is the change in the number of employees in the impairment year and subsequent year relative to the number of employees at the beginning of the impairment year. In Panel B, information on non-farm payroll is obtained from the U.S. Bureau of Labor Statistics. For each year, the change in employment at firms with impairment includes the change in the number of employees at firms reporting goodwill impairment in the current year and firms reporting goodwill impairment in the prior year. The percentage numbers in the last column of Panel B are the ratios of the change in employment at firms with impairment to the change in employment for the non-farm payroll and appear in (without) parenthesis when impairment firms lay off employees while the total U.S. economy adds (loses) jobs.