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ARTICLE INFO	Qingzhong Ma and Andrey D. Ukhov (2011). Valuation of takeover targets and the market for corporate control throughout the business cycle. *Insurance Markets and Companies*, *2*(1)
RELEASED ON	Monday, 04 April 2011
JOURNAL	"Insurance Markets and Companies"
FOUNDER	LLC "Consulting Publishing Company "Business Perspectives"

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
0	0	0

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Valuation of takeover targets and the market for corporate control throughout the business cycle

Abstract

The purpose of this paper is to study mergers and acquisitions activity in the insurance industry in a comprehensive data set covering thirty years of transactions. Several results are found in the study. First, it is found that privately held takeover targets command lower valuations in takeovers than publicly traded firms. For example, the ratios of Deal Value to Sales, Price to EPS, and Deal Value to EBITDA are all lower for privately held targets than public targets. On average, the valuation multiples are 45% lower for private acquisition targets relative to public firms. Second, the paper studies the effect of the business cycle – recessions and expansions – on valuation. The discount of private targets relative to public targets is present at all stages of the business cycle, both in expansions and in recessions. The private discount, however, is less severe during recessions than non-recessions. Jointly, these results suggest that recessions have an important impact on the market for corporate control.

Keywords: mergers and acquisitions, market for corporate control, valuation.

Introduction

How do periods of prosperous and adverse economic conditions impact the market for corporate control in the insurance industry? The corporate mergers and acquisitions (M&A) activity is an important mechanism for resource allocation in the corporate sector[1]. As economic conditions fluctuate between periods of economic expansion and recessionary periods, these changes may influence M&A activity by altering growth prospects in an industry, as well as by changing the cost of capital. Understanding and studying these changes is an interesting and important topic for empirical research[2].

In this paper we study the impact of the business cycle – expansions and recessions – on mergers and acquisitions in the insurance industry. It is not surprising that the insurance industry may be affected by the recent financial crisis, and more generally, by the business cycle. There are several channels through which economic conditions may impact insurance companies. The first channel is through investment activities of the insurance companies[3]. Insurance companies are large investors in international financial markets. Insurance companies acquire exposure to economic conditions through their investment portfolios (Schich, 2010). The second channel is through business activities. Insurance companies are now providing a growing range of financial services, as traditional boundaries between banking, insurance and other types of financial service providers have become increasingly blurred. For example, during adverse economic times losses from units that are involved in writing credit default swaps, providing credit protection and capital market trading can overweight the profits from core businesses (Schich, 2010).

We study mergers and acquisitions activity in the insurance industry in a comprehensive data set covering thirty years of transactions, from 1980 through 2009. This time period covers a variety of economic conditions, including periods of growth and periods of recessions. We study acquisitions of both privately held (non-listed) targets and of publicly traded (listed) targets. We report several new results:

♦ we find that private firms are sold at lower valuation multiples than public firms;

♦ the finding that privately held takeover targets command lower valuations in takeovers than publicly traded firms is interesting on its own. The magnitude of the discount is important, too. On average, the valuation multiples are 45% lower for private acquisition targets relative to public firms;

♦ the discount of private targets relative to public targets is present at all stages of the business cycle, both in expansions and in recessions. Thus, our previous result of private target discount is robust;

♦ the discount of private targets relative to public targets is smaller (relative valuation is higher) during recessions than expansions.

We make several contributions to the prior literature[4]. First, the prior literature on M&A activity in the insurance industry is focused on productivity and efficiency impact of mergers. Our emphasis is

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[1] Insurance companies are active in mergers and acquisitions. The well-known American International Group (AIG), for example, had a complicated organizational structure assembled from a collection of companies, consisting of a global financial service holding company with 71 U.S. based insurance companies and 176 other financial service companies.

[2] Studies of mergers and acquisitions activities provide important information about business practices in an industry (Canina, Kim and Ma, 2010; Bhuyan, Ng, and Vaziri, 2010; Ma, Zhang, and Chowdhury, 2010; Ma, Whidbee, and Zhang, 2010).

[3] Kozarević, Safet and RadivojKovač (2010) describe some reserve management practices of insurers. During adverse economic times, diversification benefits even within well-constructed portfolios may diminish, contributing to declining portfolio values (Javeri and Strong, 2010).

[4] We discuss the prior literature in detail in a later section of the paper.

on the pricing of the transactions and on valuation. Second, while there is some theoretical work which suggests that business cycles may impact M&A activity (Shleifer and Vishny, 2003; Bouwman, Fuller, and Nain, 2009), empirical evidence is scarce. We contribute by showing that recessions have impact on both absolute valuation in corporate transactions, as well as relative valuation of public versus private firms. Third, while there is an existing literature on the relative valuation of private versus public targets (Officer, 2007), this literature does not provide a link between economic conditions and relative valuations. We are able to show that this link is strong. Last, but not least, we show that the empirical effects of economic conditions on relative valuations can be viewed within the context of a commonly used theoretical valuation framework.

In the remainder of the paper we describe conceptual framework of the analysis, the data, and empirical findings.

1. Conceptual approach

There are several reasons why changes in economic conditions can have a large impact on valuation in corporate transactions. To illustrate this, consider a widely spread and commonly used valuation approach, the Gordon growth model[1]. According to this valuation framework, the value of the business, P, is given by

$$P = \frac{E}{r - g}, \tag{1}$$

where E is the value of earnings from the business, r is the discount rate that reflects the risk of the future earnings stream, and g is the expected growth rate for earnings. Equation (1) can be re-written in terms of a commonly used valuation metric, price-to-earnings ratio, or P/E ratio:

$$P/E = \frac{1}{r - g}.$$

The ratio reflects both the risk of the business (as reflected in the discount rate r) and the growth prospects of the business, as reflected in the growth rate g. All else equal, firms with lower growth prospects (lower g) will have a lower P/E ratio[2].

Within this valuation framework, economic shocks, such as recessions, can impact value P by affecting the discount rate r and the expected growth rate, g. Consider these effects. In recessions, growth pros-

pects of firms are re-evaluated and are adjusted downward. A lower growth rate, g results in a lower valuation multiple, P/E. Stated formally, P/E is an increasing function in g and a drop in g causes a drop in P/E.

Another source of the effect can be due to changes in the discount rate. There are several reasons why worsening economic conditions can lead to an increase in the cost of capital (discount rate). As appetite to take risks decreases in recessions, and investors start behaving in a more risk-averse fashion, the required rate of return (discount rate) increases. In addition to an increase in risk aversion, cost of capital may rise in recessions due to worsening liquidity conditions (Goyenko and Ukhov, 2009; Goyenko, Subrahmanyam, and Ukhov, 2011). A higher discount rate results in a lower valuation multiple, P/E.

To evaluate *relative* effects, consider percent change in P/E. It can be shown that higher levels of P/E correspond to a larger percent change in this valuation multiple.

The effects of adverse economic conditions (recessions) on P/E valuation multiple can be summarized as follows:

Implication 1. The valuation multiple, P/E, expected to be lower in transactions carried out during recessions.

Implication 2. The magnitude of the impact is larger when the P/E ratio is larger. Bigger P/E's will drop by a larger amount in recessions.

Implication 3. Higher levels of P/E correspond to a larger percent change in this valuation multiple.

1.1. Relative valuation. We can also use this framework to evaluate the effect of recessions on *relative valuation* of private targets vs. public targets. Define *excess valuation multiple*, *Excess P/E*, as percent difference between P/E ratio of a private firm and a corresponding (similar) public target:

$$Excess\ P/E = \frac{P/E_{Private} - P/E_{Public}}{P/E_{Public}}.$$

The *Excess P/E* ratio can change if changing economic conditions bring about a change in growth rates and discount factors. For this discussion we maintain the assumption that P/E ratio of private firms is lower than the P/E ratio for similar public firms, and therefore, the *Excess P/E* ratio is negative[3]. Consider two cases.

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[1] The effect of recessions on other valuation multiples can be analyzed in the similar manner. Without loss of generality, we focus on P/E ratio to illustrate the conceptual framework.
[2] Derivations of the equations supporting the discussion in this section are given in the Appendix.

[3] In the empirical section that follows we show that private firms are sold at a discount to public firms and the excess ratio is negative in the data.

Case 1. Assume that private and public firms have the same growth rates, g. The difference in P/E ratios, therefore, comes from the differences in the discount rates, $r_{Private}$ and r_{Public}. The P/E ratio for public firms being higher than the P/E ratio for private firms is consistent with the discount rate for public firms being lower than the discount rate for private firms, $r_{Private} > r_{Public} \Rightarrow P/E_{Private} < P/E_{Public}$. When the growth rate, g, changes due to a change in economic conditions, the *Excess P/E* ratio will change. It can be shown that *Excess P/E* ratio is decreasing in g. Thus, a decrease in g leads to an increase in the *Excess P/E* ratio. For example, if the *Excess P/E* ratio is negative, a decrease in the growth rate g can cause *Excess P/E* ratio to increase from -0.5 to -0.4.

Case 2. Assume that private and public firms have the same discount rate, r. The difference in P/E ratios, therefore, comes from the differences in the growth rates, $g_{Private}$ and g_{Public}. If $P/E_{Private} < P/E_{Public}$, then this is consistent with $g_{Private} < g_{Public}$. An increase in discount rate will lead to an increase in the *Excess P/E* ratio. Thus, a recession can lead to an increase in the discount rate, which in turn will cause *Excess P/E* ratio to increase.

Implication 4. *Excess P/E* ratio (the relative difference between valuation of private and public targets), can increase during recessions. If private firms sell at a discount to public targets, *Excess P/E* ratio is negative, and an increase in *Excess P/E* means that private firms may be not discounted as deeply in recessions. For example, *Excess P/E* can change from -0.30 (a 30% lower multiple) to -0.20 (a 20% lower multiple).

We use P/E ratio, an important valuation metric, to illustrate how changes in economic conditions can affect valuation of takeover targets. In the next sections we perform empirical study of mergers and acquisitions.

2. Data

Our data on mergers and acquisitions in the insurance industry comes from the Securities Data Corporation (SDC) Platinum database. The data covers all mergers and acquisitions in the insurance industry for a thirty-year period from 1980 to 2009. The long period of study allows us to capture a variety of economic conditions – recessions and non-recessionary periods. We use recession dates defined by the NBER (The National Bureau of Economic Research)[1]. We refer to the times

of NBER recessions as *recessionary times* or times of *adverse economic conditions*. Times, that do not correspond to recessions, are *expansionary times* (economic expansions) or *non-recessionary periods*.

Our goal is to study transaction valuation in the insurance industry. Hence, our empirical strategy is to construct an inclusive sample to explore the pricing in any transactions involving insurance companies and insurance assets. In forming the sample of M&A transactions, we apply the following filters (the last three filters are standard in the M&A literature):

- ♦ either the acquirer or the target has the key word "insurance" in its business description;
- ♦ the target is either a publicly traded company, a subsidiary, or a privately-held company;
- ♦ buybacks, exchange offers, and recapitalizations are excluded;
- ♦ the minimal deal size is $1million.

Because the study focuses on one industry, we do not impose any further restrictions on the sample to retain the statistical power in our empirical analysis. In our multiple regressions more firm and deal characteristics are controlled to see if the relative pricing associated with recession remains.

Figure 1 (see Appendix) shows the distribution of transactions in the industry. The figure plots the number of mergers and acquisition (M&A) transactions in each quarter from 1980 through the end of 2009. Shaded vertical bars indicate NBER recessions. The figure suggests that recessions have an effect on the market for corporate transactions: M&A deal volume drops in recessions. In addition to having an impact on the number of deals, as illustrated in Figure 1, recessions can also have an effect on the valuation in the transactions. We study this in the next section.

In this study we use four valuation metrics or acquisition multiples: *Deal Value to Sales* ratio; *Deal Value to EBITDA* ratio; *Price to Earnings*; and *Price to Book Value of Equity*. We fist study the *levels* of valuation multiples in recessions and non-recessionary periods. We then study the *relative valuation* of private targets and publicly traded targets. As indicated in the previous section, changing economic conditions can have an impact on both absolute values of valuation multiples, and on relative (excess) values.

To measure relative valuation of private acquisition targets and publicly traded targets we use the following approach. For each unlisted target we find comparable acquisitions of publicly traded targets, where comparable acquisitions are those for which the publicly traded target has deal value excluding assumed liabilities within 20% of the deal value excluding assumed liabilities for the unlisted target (deal value measures are from

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[1] Bidders are U.S. and foreign firms. In the regression analysis we include control variables *U.S. Target* and *U.S. Acquirer*. Bidders are both listed and private companies. We include the variable *Public acquirer* as a control variable in the regression analysis.

SDC), and is announced within the three-calendar year window centered on the announcement of the unlisted acquisition. This technique allows us to focus on comparable transactions[1].

3. Results

The focus of this paper is on the variation in valuations in corporate transactions throughout the business cycle. In studying the effect of business cycle on valuation multiples we have several objectives. First, we compare the multiples paid in acquisition during recessionary and non-recessionary periods. The goal is to establish whether prices paid for targets are different during different stages of the business cycle. Second, we compare *relative* multiples paid for private and public targets. For example, if we establish that private companies are sold at a discount relative to publicly traded targets, we can investigate whether this discount changes with economic conditions. Therefore, we analyze whether economic conditions change *absolute* and *relative* pricing in takeovers.

3.1. Relative valuation of private and public targets. First, we study whether there is any evidence that public and private companies purchased in takeovers receive different valuation. Consider price to EPS ratio reported in Table 1 (see Appendix). The median *P/E* ratio paid for public targets equals 18.0 (for all economic conditions)[2]. The median *P/E* ratio is lower for private standalone companies, and equals 17.6. The ratio is significantly lower for subsidiaries of private firms, and equals 14.10[3]. This suggests that private firms receive lower valuation multiples in takeovers than publicly traded targets. Similar results are evident in another valuation multiple, *Price to Book Value of Equity* (Table 1). The median value for this ratio equals 1.77 for public targets. The value is lower for private standalone firms at 1.65; and it is lower yet for subsidiaries of private firms, and equals 1.53[4]. Overall, the evidence suggests that private companies are valued at lower multiples relative to publicly traded firms. We provide additional evidence of that when we discuss *relative* valuation in the next section.

3.2. The effect of the business cycle. In Table 1 we compare multiples paid for public and private targets during recessions and during non-recessionary periods. The results presented in the table suggest that the multiples paid in recessions are lower than the multiples during non-recessionary periods. Consider the *Deal Value to Sales* ratio. The median value of this ratio, for all target types (public and private) equals 1.13. The number, however, is substantially lower in recessions and equals 0.87, compared to 1.17 in non-recessionary times. The z-test for the difference in medians equals -4.92, showing that the difference is strongly statistically significant.

Similar pattern emerges when we look at the other three valuation ratios presented in Table 1, the *Deal Value to EBITDA* ratio, *Price to Earnings per Share* (*Price/EPS*) ratio, and *Price to Book Value of Equity* ratio. The median Deal Value to EBITDA ratio in non-recessionary times is 9.71, significantly higher than 8.41 in recessions (the difference is significant at 1% level). *Price to Earnings per Share* ratio is 18.2 during economic expansions and 15.4 in recessions (the difference is significant at 1% level). This is an economically significant 15% drop in this important valuation metric during adverse economic times. The median *Price to Book Value of Equity* ratio is 1.75 in all transactions. In recessions, however, this number is 1.24, below 1.84 in non-recessionary times (the difference is statistically significant at 1% level). This corresponds to a 33% drop in the *Price to Book Value of Equity* ratio in recessions[5]. Taken together, the evidence indicates that valuation multiples in corporate transactions are lower in recessions than the multiples paid during economic expansions.

In addition to the evidence on *absolute* valuation levels discussed above, we also compare *relative* valuation of private and public targets. The results for relative valuation are shown in Table 2 (see Appendix). The table presents excess valuation multiples. For each private target we find its matching publicly traded targets. We match on transaction size and on the time period (the matched public targets come from takeovers within a three-year window centered on the announcement date of the takeover of the private firm)[6]. The average multiple of the matching public targets is used as the benchmark. We then compute *excess valuation multiple* as a percent difference between the valuation multiple for the private firm and the average valuation multiple for the matched public targets:

$$Excess\ Multiple = \frac{Multiple_{Private} - Multiple_{Matched\ Public}}{Multiple_{Matched\ Public}}.$$

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[1] This matching approach is similar to that adopted in Officer (2007).
[2] Throughout the statistical analysis we focus on the median values and statistical tests for differences in medians. This allows us to avoid being influenced by outliers and is an appropriate approach given the distributional properties of the valuation multiples.
[3] The difference between *P/E* ratio for public targets and for subsidiaries of private firms is statistically significant at 1% level.
[4] The difference between *Price to Book Value of Equity* ratio for public targets and for private standalone firms is statistically significant at 5% level.

[5] The average (the *mean*) *Price to Book Value of Equity* for the complete sample equals 3.01. This value equals 3.16 at times of economic expansion, and is much lower during recessions, with the average value of 2.35. The difference between *Price to Book Value of Equity* paid in expansions and recessions is statistically significant at 1% level (t-statistic is -3.52).
[6] The matching algorithm follows the existing literature (Officer, 2007).

Negative values indicate that a private company sold at a discount to a matched firm[1].

We find that private firms sell at significant discount relative to the publicly traded firms[2]. When we consider all private targets (private standalone and private subsidiaries) we find that the average discount equals 45%. The average discount equals 41% for private standalone companies and 51% for subsidiaries of private firms. We observe significant discounts in all four valuation multiples. The *Deal Value to Sales* ratio on average is 48% lower for private targets; the *Deal Value to EBITDA* ratio is 39% lower; the very common metric *Price to Earnings per Share* is 45% lower for private targets; and *Price to Book Value of Equity* is 24% lower (on average) for private firms.

The discount exists for both private standalone forms and subsidiaries of private firms. Consider the data in the last two columns of Table 2 (see Appendix). The average *Deal Value to Sales* ratio discount equals 45% for private standalone firms and 52% for subsidiaries of private firms. The average *Deal Value to EBITDA* ratio discount is 32% for private standalone targets and 50% for private subsidiaries; the corresponding values are 40% and 52% for the *Price to EPS* ratio, and 21% and 30% for the *Price to Book Value of Equity*.

We now discuss whether changes in economic conditions have interesting relative effects. Consider results in Table 1 (see Appendix). For public targets, the *Price to EPS* ratio drops from 18.4 in expansions to 16.1 in recessions, a -12.5% change. For private standalone targets, the *Price to EPS* ratio decreases from 19.0 in expansions to 13.95 in recessions, a -26.6% change. In case of private subsidiaries, the Price to EPS ratio changes by -8.5%, from 14.1 in expansions to 12.9 in recessions. This pattern of changes is consistent with the theoretical motivation considered in an earlier section, where higher levels of *P/E* correspond to a larger percent change in this valuation multiple.

Now consider the changes in *relative* valuations reported in Table 2. In an earlier section we showed that excess ratios can increase during recessions (Implication 4). Using *Excess P/E* ratio as an illustration, we showed that when private firms sell at a discount to public firms (negative excess ratios) the discounts may decrease in recessions. For example, Excess P/E ratio can change from -0.30 (a 30% lower multiple) to -0.20 (a 20% lower multiple).

The data in Table 2 support this conjecture. Consider the average of four excess multiples. The average discount for all targets is -0.47 (47% discount) in expansions; it equals -0.38 (38% discount) in recessions; and the difference is statistically significant at 1% level. The median values are -0.57 (a 57% discount) in expansions, -0.45 (45% discount) in recessions, and the difference is statistically significant at 1% level. This pattern holds for both private standalone targets, where the median discount changes from 53% in expansions to 44% in recessions, and for private subsidiaries (median discount of 62% in expansions and 47% in recessions)[3]. Overall, we find that private firms, relative to their comparable public targets, are not discounted as deeply in recessions as during non-recessionary periods.

Next we address the possibility that several deal and firm characteristics may also be related to the valuation discount. To do this we examine the discount in the multiple regression framework with results presented in Table 3 (see Appendix). The dependent variable in each regression is a measure of relative discount – an excess valuation ratio. These are the same measures as in Table 2. A negative *Intercept* in the regression indicates a discount of a private target valuation relative to public targets, after controlling for other deal and company characteristics. A negative intercept is consistent with the results previously presented in Table 2. The main independent variable of interest is a dummy variable *Recession*, which is equal to one if the month is announced the deal is an NBER recession month and zero otherwise. The coefficient on the *Recession* variable captures the impact of recessions on the relative valuation after controlling for other variables. A positive coefficient indicates a decrease in the discount during recessions (consistent with findings reported in Table 2).

We include several control variables in the regression[4]. We control for the payment method in the transaction by including the variable *Cash deal* (it equals one if the deal is paid in cash and zero otherwise). We control for the size of the deal with *Ln (deal value)*, the natural logarithm of the total deal value (in US$ million). We control for acquisitions that result in a change of control, i.e., the acquirer held less than 50% prior to the acquisition and more than 50% after, by including the *Control change* variable which equals one for change of control transactions. The variable *Standalone target* is equal to one if the

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[1] Due to the noise in the SDC valuation multiple data, we discard observations with excess multiples greater than 100%, following Officer (2007, pp. 582-3).

[2] The results presented in Table 2 also indicate that private firm discount exists in both recessionary and non-recessionary periods.

[3] Our Implication 4 in the Section 1 was stated for the Excess P/E ratio. The average Excess P/E ratio for all targets is -0.47 (a 47% discount) in expansions and -0.36 (a 36% discount) in recessions, and the difference is statistically significant at 5% level. Results on other multiples are qualitatively similar, although the statistical significance is in some cases weaker.

[4] We thank an anonymous referee for suggesting several of the controls.

target is a standalone private company and zero if it is a subsidiary; *Public acquirer* is one if the acquirer is a publicly traded company; *Complete deal* is equal to one if the deal is completed; *U.S. Target* is equal to one if the target is from the U.S.; *U.S. Acquirer* is equal to one if the acquirer is from the U.S.; *Cross border* is equal to one if the deal is a cross border transaction.

Regression results support findings reported in Table 2. Consistent with the evidence reported in Table 2, all regression models show negative excess valuation ratio (negative intercept), which is strongly statistically significant. This shows, that after controlling for deal and company characteristics, private firms receive lower valuation multiples than public takeover targets. Positive coefficient on the *recession* variable indicates that after controlling for several characteristics, the average discount decreases in recessions. The first regression model shows that the average excess valuation multiple is 9.5% higher in recessions than during expansions, which is consistent with the univariate result in Table 2. The results in other regressions for other excess valuation ratios support this conclusion. For example, when the dependent variable is *Excess P/E* ratio, the average excess P/E ratio is 11.3% higher in recessions than in non-recessionary times, and the *Recession* variable is statistically significant at 5% level. This is similar to the results in Table 2. When the dependent variable is *Excess Price to Book Value* ratio, the valuation ratio is 16.1% higher in recessions (the *recession* coefficient is significant at 5% level).

Among other control variables, paying cash has a negative (and significant) coefficient, indicating that the sellers selling assets for cash demand liquidity and are willing to accept a lower price, consistent with Officer (2007). Standalones on average suffer less in discount than subsidiaries (consistent with univariate results in Table 2); discount is also smaller for larger deals. Other characteristics, however, do not impact relative valuation.

4. Literature review

This study is related to several strands of the literature. First, the literature on M&A in the insurance industry has been focused on the effect of M&A on efficiency and productivity (Cummins and Xie, 2008; Cummins, Tennyson, and Weiss, 1999), and the stock price reactions (Cummins and Xie, 2006; Cummins and Weiss, 2004; Akhigbe and Madura, 2001). While collectively both listed and unlisted targets are examined in these studies, none have investigated the *pricing* in the transactions, and have not studied the relative pricing of listed and unlisted targets. Our paper fills in this gap by showing that pricing of corporate assets can vary with (a) status

of the target; and (b) the business cycle. We, thus, contribute to the understanding of M&A deal pricing in the insurance industry.

Second, our study is naturally related to the influence of the business cycle on M&A activity. Corporate transactions and corporate valuations may be affected by the business cycle through the availability of credit and ability to raise financing. For example, theoretically, M&A transactions may be driven by stock market valuations of the merging firms (Shleifer and Vishny, 2003). Previous researchers concentrated on building theories that focus on the relation between high valuation periods and M&A *activity*, or propensity to transact (Shleifer and Vishny, 2003; Bouwman, Fuller, and Nain, 2009). The emphasis of the prior theoretical and empirical work is on periods of high valuation. Our study is empirical in nature and it focuses on the other extremity of the spectrum-recessions, during which time the valuations are usually *low*. We also focus on *valuation*. To the best of our knowledge, our study is first to document lower valuations in corporate transactions during recessions. This study is also first to examine both absolute valuations and relative valuations.

Third, our study is related to the growing literature on acquisitions of listed and unlisted targets. It is well documented that acquirers earn significant positive abnormal returns in buying unlisted targets while the returns in acquiring listed targets are not significantly different from zero or even negative (Chang, 1998; Fuller, Netter, and Stegemoller, 2002; Faccio, McConnell, and Stolin, 2006; Draper and Paudyal, 2006). Officer (2007) studies the relative pricing between listed and unlisted acquisitions. While closely related to Officer (2007), our study has several differences. First, we focus on one industry (insurance industry), in which most companies are unlisted (see Cummins and Xie, 2008). In addition, it is the first study to explicitly examine the effect of recessions on the relative pricing between listed and unlisted acquisitions.

Last, but not least to the best of our knowledge, we are the first in the literature to offer a simple link between a parsimonious theoretical valuation framework and empirical evidence on the relative pricing in corporate transactions, and its variations across the business cycle.

Concluding remarks

The purpose of this paper is to study mergers and acquisitions activity in the insurance industry in a comprehensive data set covering thirty years of transactions. The long time series allows us to capture both the times of economic expansions and recessions. There is an interesting and active market for corporate control in the insurance industry. We report several new results. The first set

of results speaks to the *relative valuation* of privately held takeover targets and public targets. There is evidence that privately held takeover targets command lower valuations in takeovers than publicly traded firms. The ratios of *Deal Value to Sales*, *Price to EPS*, and *Deal Value to EBITDA* are all lower for privately held targets than public targets. On average, the valuation multiples are 45% lower for private acquisition targets relative to public firms.

Our second set of results is related to the effect of the business cycle – recessions and expansions – on valuation. We begin by establishing that the discount of private targets relative to public targets is present at all stages of the business cycle, both in expansions and in recessions. Therefore, our first result of the discount of private targets relative to public targets holds, both during economic expansions and during recessions. We proceed further by studying the effect of the business cycle on valuation levels. We find that private targets receive relatively higher valuations in recessions: multiples, paid for private targets during recessions relatively to public targets, are higher than during non-recessionary periods. Thus, the discount for private targets is lower in recessions. Jointly, these results suggest that recessions have an important impact on the market for corporate control.

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Appendix

1. *P/E* is an increasing function in *g* and a drop in *g* causes a drop in *P/E*,

$$\frac{\partial P/E}{\partial g} = \frac{\partial}{\partial g}\left[\frac{1}{r-g}\right] = \frac{1}{(r-g)^2} = (P/E)^2 > 0.$$

2. A higher discount rate results in a lower valuation multiple, P/E,

$$\frac{\partial P/E}{\partial r} = \frac{\partial}{\partial r}\left[\frac{1}{r-g}\right] = -\frac{1}{(r-g)^2} = -(P/E)^2 < 0.$$

3. To evaluate relative effects we consider percent change in P/E:

$$\frac{\partial P/E}{\partial g}/(P/E) = \frac{(P/E)^2}{(P/E)} = (P/E) > 0,$$

$$\frac{\partial P/E}{\partial r}/(P/E) = -\frac{(P/E)^2}{(P/E)} = -(P/E) < 0.$$

4. For the discussion that follows we maintain the assumption that P/E ratio of private firms is lower than the P/E ratio for similar public firms, and therefore the *Excess P/E* ratio is negative.

Case 1. Private and public firms have the same growth rates, g, but different discount rates, $r_{Private}$ and r_{Public}. The P/E ratio for public firms being higher than the P/E ratio for private firms is consistent with the discount rate for public firms being lower than the discount rate for private firms, $r_{Private} > r_{Public}$. Then, *Excess P/E* ratio is decreasing in g,

$$\frac{\partial}{\partial g} Excess\, P/E = \frac{\partial}{\partial g}\frac{P/E_{Private} - P/E_{Public}}{P/E_{Public}} = \frac{\partial}{\partial g}\frac{\dfrac{1}{r_{Private}-g} - \dfrac{1}{r_{Public}-g}}{\dfrac{1}{r_{Public}-g}} = \frac{r_{Public}-r_{Private}}{(g-r_{Private})^2} < 0$$

Case 2. Private and public firms have the same discount rate. The difference in P/E ratios, therefore, comes from the differences in the growth rates, $g_{Private}$ and g_{Public}, with $g_{Private} < g_{Public}$. An increase in discount rate will lead to an increase in the *Excess P/E* ratio:

$$\frac{\partial}{\partial r} Excess\, P/E = \frac{\partial}{\partial r}\frac{P/E_{Private} - P/E_{Public}}{P/E_{Public}} = \frac{g_{Public}-g_{Private}}{(r-g_{Private})^2} > 0$$

The Figure 1 plots the number of mergers and acquisitions transactions in each quarter from 1980 through the end of 2009 (solid line). Shaded vertical bars indicate NBER recessions. A quarter is shaded as in recession if at least two months of the quarter were in NBER recessions.
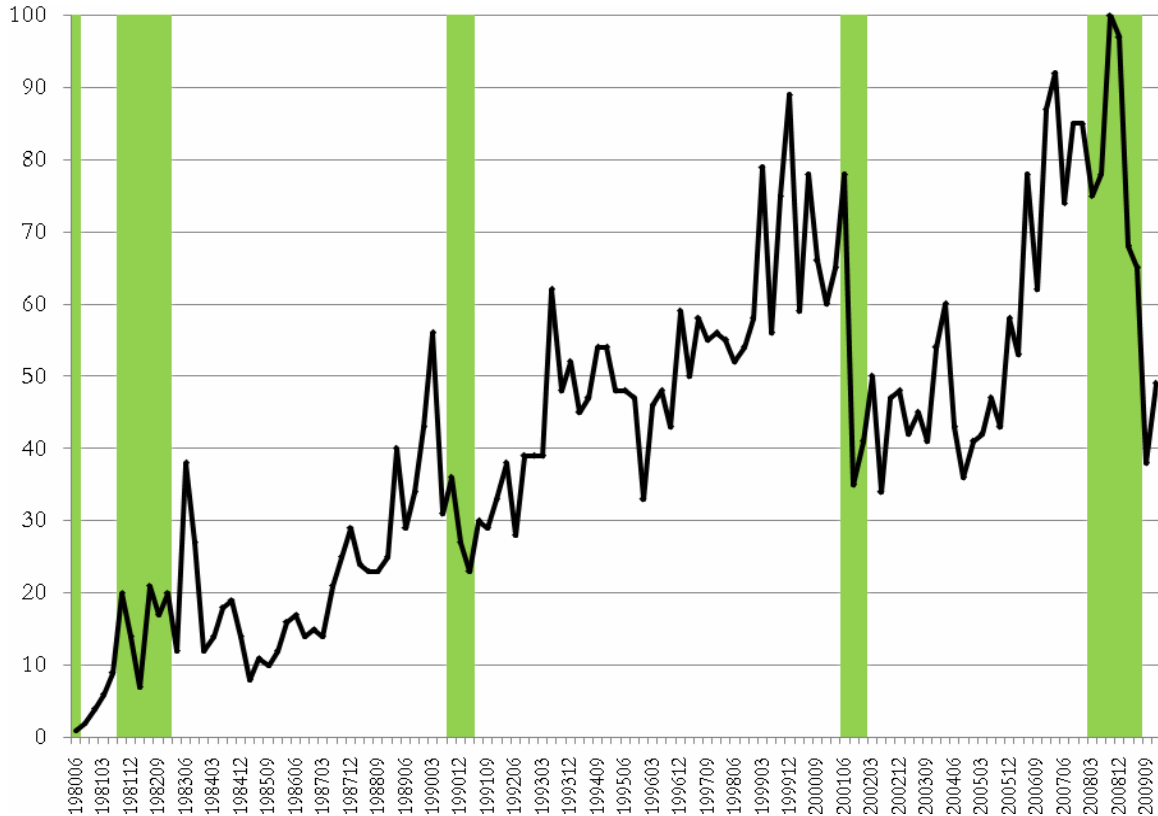

Fig. 1. The distribution of quarterly transactions in the insurance industry

Table 1. Raw valuation multiples by economic condition and target public status

Variables	Sample	All targets	Public target	Private standalone	Private subsidiary
Deal Value/Sales	Mean	3.68***	3.16***	4.92***	5.51***
	Median	1.13***	1.09***	1.33***	1.04***
	N	5026***	3728***	730	568
	Non-recession	3.70***	3.25***	4.93***	5.14***
		1.17***	1.15***	1.35***	1.05***
		4179	3113	600	466
	Recession	3.55***	2.66***	4.89***	7.23***
		0.87***	0.83***	1.26***	0.99***
		847	615	130	102
	T(R - NR)	-0.33	-1.48	-0.03	0.90
	Z(R - NR)	-4.92***	-5.40***	-0.98	-0.12
Deal Value/EBITDA	Mean	20.08***	18.51***	26.83***	31.57***
	Median	9.56***	9.55***	10.84***	8.22***
	N	2491	2104	243	144
	Non-recession	20.21***	18.62***	27.43***	31.09***
		9.71***	9.72***	10.84***	7.40***
		2109	1779	207	123
	Recession	19.33***	17.91***	23.39***	34.38*
		8.41***	8.33***	10.70***	8.45***
		382	325	36	21
	T(R - NR)	-0.36	-0.29	-0.47	0.17
	Z(R - NR)	-2.36**	-2.89***	0.22	0.91
Price/EPS	Mean	43.60***	41.95***	53.72***	44.28***
	Median	17.70***	18.00***	17.60***	14.10***
	N	3759	2954	459	346
	Non-recession	43.48***	41.90***	52.98***	45.18***
		18.20***	18.40***	19.00***	14.10***
		3169	2521	369	279
	Recession	44.25***	42.23***	56.74***	40.53***
		15.40***	16.10***	13.95***	12.90***
		590	433	90	67
	T(R - NR)	0.15	0.06	0.21	-0.28
	Z(R - NR)	-4.60***	-4.07***	-1.73*	-0.47
Price/Book Value Equity	Mean	3.01***	3.08***	2.12***	2.51***
	Median	1.75***	1.77***	1.65***	1.53***
	N	2782	2570	140	72
	Non-recession	3.16***	3.19***	2.48***	2.78***
		1.84***	1.85***	1.75***	1.38***
		2293	2150	91	52
	Recession	2.35***	2.47***	1.46***	1.81***
		1.24***	1.22***	1.28***	1.64***
		489	420	49	20
	T(R - NR)	-3.52***	-2.76***	-2.09**	-1.50
	Z(R - NR)	-9.06***	-8.55***	-3.22***	0.72

Notes: The table displays valuation multiples for mergers and acquisitions in the insurance industry. Four valuation ratios are reported: *Deal Value to Sales*; *Deal Value to EBITDA*; *Price to Earnings*; and *Price to Book Value of Equity*. The ratios are reported for all targets (publicly traded targets and private firms) together, as well as for three categories of targets separately. Target categories are: (1) publicly traded target firms; (2) private standalone firms; (3) subsidiaries of private firms. We report the mean, median, and the number of firms (N) in the category. Recessions are defined as NBER recessions. The test statistic for the differences between Recessions (R) and non-recessions (NR) is reported: *t*-test for the difference in means, and z-test for the Wilcoxon tests of the distributions; the symbols ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Table 2. Excess valuation multiples sorted by economic condition and target public status

The table displays excess valuation multiples for mergers and acquisitions in the insurance industry. Excess multiples are computed as follows. For a privately held target firm we find a matching public target (the match is on transaction size among mergers announced within three years of the private target's announcement date). Excess multiples are then computed as:

$$Excess\ Multiple = \frac{Multiple_{Private} - Multiple_{Matched\ Public}}{Multiple_{Matched\ Public}}.$$

Variables	Sample	All targets	Private standalone	Private subsidiary
Excess: Average of the four	Mean	-0.45***	-0.41***	-0.51***
	Median	-0.55***	-0.51***	-0.60***
	N	1256	700	556
	Non-recession	-0.47***	-0.43***	-0.53***
		-0.57***	-0.53***	-0.62***
		1043	580	463
	Recession	-0.38***	-0.32***	-0.44***
		-0.45***	-0.44***	-0.47***
		213	120	93
	T(R - NR)	2.81***	2.21**	1.73*
	Z(R - NR)	2.95***	2.39**	1.69*
Excess: Deal Value/Sales	Mean	-0.48***	-0.45***	-0.52***
	Median	-0.63***	-0.60***	-0.66***
	N	1084	610	474
	Non-recession	-0.49***	-0.45***	-0.53***
		-0.63***	-0.61***	-0.66***
		909	512	397
	Recession	-0.45***	-0.44***	-0.47***
		-0.59***	-0.57***	-0.67***
		175	98	77
	T(R - NR)	0.89	0.32	0.98
	Z(R - NR)	0.82	0.68	0.43
Excess: Deal Value/EBITDA	Mean	-0.39***	-0.32***	-0.50***
	Median	-0.54***	-0.46***	-0.61***
	N	323	201	122
	Non-recession	-0.39***	-0.32***	-0.51***
		-0.54***	-0.43***	-0.64***
		278	172	106
	Recession	-0.35***	-0.31***	-0.44***
		-0.53***	-0.54***	-0.44***
		45	29	16
	T(R - NR)	0.54	0.15	0.94
	Z(R - NR)	0.97	0.13	1.70*
Excess: Price/EPS	Mean	-0.45***	-0.40***	-0.52***
	Median	-0.58***	-0.52***	-0.64***
	N	687***	380	307
	Non-recession	-0.47***	-0.41***	-0.55***
		-0.58***	-0.53***	-0.67***
		560	311	249
	Recession	-0.36***	-0.33***	-0.40***
		-0.54***	-0.52***	-0.58***
		127	69	58
	T(R - NR)	2.31**	1.37	1.98*
	Z(R - NR)	2.22**	1.23	1.92*
Excess: Price/Book Value Equity	Whole	-0.24***	-0.21***	-0.30***
		-0.27***	-0.23***	-0.43***
		186	123	63

Table 2 (cont.). Excess valuation multiples sorted by economic condition and target public status

Variables	Sample	All targets	Private standalone	Private subsidiary
Excess: Price/Book Value Equity	Non-recession	-0.30***	-0.22***	-0.44***
		-0.32***	-0.22***	-0.53***
		125	80	45
	Recession	-0.12*	-0.19**	0.05
		-0.22*	-0.27**	0.02
		61	43	18
	T(R - NR)	2.57**	0.43	3.67***
	Z(R - NR)	2.38**	0.20	3.49***

Notes: Negative values indicate that a private company sold at a discount to a matched firm. Excess multiples are computed for four valuation ratios: *Deal Value to Sales*; *Deal Value to EBITDA*; *Price to Earnings*; and *Price to Book Value of Equity*. The excess multiples are reported for all targets (both private standalone firms and subsidiaries of private firms), as well as for the private standalone and for subsidiaries of private firms, separately. We report the mean, median, and the number of firms (N) in the category. Recessions are defined as NBER recessions. The test statistic for the differences between recessions (R) and non-recessions (NR) is reported: *t*-test for the difference in means, and z-test for the Wilcoxon tests of the distributions; the symbols ***, **, * indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Table 3. Regression results

Independent variables	Dependent variables				
	Average excess multiple	Excess Deal Value / Sales	Excess Deal Value /EBITDA	Excess Price /Earnings	Excess Price / Book value
Recession	0.095	0.038	0.048	0.113	0.161
	(2.94)***	(0.93)	(0.62)	(2.37)**	(2.09)**
Cash deal	-0.075	-0.064	-0.142	-0.065	-0.193
	(-2.85)***	(-2.07)**	(-2.41)**	(-1.73)*	(-2.13)**
Standalone target	0.128	0.092	0.211	0.142	0.046
	(4.86)***	(2.94)***	(3.70)***	(3.81)***	(0.63)
Ln (deal value)	0.032	0.028	0.027	0.029	0.016
	(4.45)***	(3.17)***	(1.74)*	(3.04)***	(0.72)
Control change	0.001	0.064	0.107	-0.073	-0.088
	(0.03)	(1.42)	(1.42)	(-1.33)	(-1.07)
Public acquirer	-0.018	-0.037	-0.019	0.038	0.056
	(-0.65)	(-1.08)	(-0.27)	(0.94)	(0.67)
Complete deal	-0.034	-0.044	0.035	0.002	0.223
	(-0.79)	(-0.81)	(0.39)	(0.03)	(2.70)***
U.S. Target	0.003	0.009	0.020	0.037	0.061
	(0.07)	(0.17)	(0.18)	(0.51)	(0.51)
U.S. Acquirer	-0.000	-0.008	-0.101	-0.065	-0.065
	(-0.01)	(-0.15)	(-1.02)	(-0.94)	(-0.60)
Cross border	-0.041	-0.040	0.034	0.034	-0.119
	(-1.28)	(-1.09)	(0.44)	(0.68)	(-1.16)
Intercept	-0.584	-0.602	-0.669	-0.604	-0.495
	(-9.29)***	(-7.54)***	(-4.93)***	(-6.52)***	(-2.44)**
N	1,256	1,084	323	687	186
Adj. R^2	0.039	0.017	0.036	0.038	0.074
Model p-value	<.0001	0.0016	0.0070	<.0001	0.0008

Notes: Five ordinary least square (OLS) regression models are presented in this table. The dependent variables for the models are the average excess multiples, the excess *Deal Value to Sales*, excess *Deal Value to EBITDA*, excess *Price to Earnings*, and excess *Price to Book Value of Equity*, respectively. These variables are defined in Table 2. *Recession* is equal to one if the month is announced the deal is an NBER recession month and zero otherwise; *Cash deal* is equal to one if the deal is paid in cash; *Standalone target* is equal to one if the target is a standalone private company and zero if it is a subsidiary; *Ln (deal value)* is the natural logarithm of the total deal value (in $ million); *Control change* is equal to one if the acquirer owns less than 50% of the target before the deal but more than 50% after the deal, indicating a change of control; *Public acquirer* is one if the acquirer is a publicly traded company; *Complete deal* is equal to one if the deal complete; *U.S. Target* is equal to one if the target is from the U.S.; *U.S. Acquirer* is equal to one if the acquirer is from the U.S.; *Cross border* is equal to one if the deal is a cross border. The sample includes all private deals, including private standalone and private subsidiaries. The sample size varies according to the data availability of the dependent variables. Presented in the parentheses are the t-statistics, based on standard errors adjusted for clustering by announcement dates. The symbols ***, **, and * indicate statistical significance at 1%, 5%, and 10% levels, respectively.