Merger Negotiations with Stock Market Feedback

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Figure 1: Information arrival process in event time.

Bid event: day -1 and +1. Target receives initial bid. Market revalues target to reflect the expected final bid premium $V_P$, creating a markup of $V_P - V_R$

Runup period: day -42 to -2. Market receive a signal, s, of synergy gains and revises probability $p$ of takeover, creating a target stock price runup of $V_R$

Pre-runup period: < day -42. Synergies in takeover perceived as negligible by the market

Betton, Eckbo, Thompson and Thorburn (2011)
Information environment

- Market receives signal $s$ about synergy gains $S$.
- $S$ known to bidder and target. Market knows only the distribution over $S$ given the signal.
- Negotiations establishes a sharing rule $\theta$ for $S$ and $\gamma$ for bidding cost $C$.
- Rational bidding threshold: $K = \frac{\gamma C}{\theta}$.
- Target benefit function: $B(S, C) (= 0$ when $S < K)$.
- Prior takeover probability $\pi(0)$ and prior target stock price normalized to zero.
Rational market pricing conditional on the rumor $s$:

- Target runup prior to the first bid announcement:

$$V_R = \pi(s) E_s[B(S, C) | s, bid] = \int_{K}^{\infty} B(S, C) g(S | s) dS \quad (1)$$

- Expected final offer and markup at first bid announcement:

$$V_P = E_s[B(S, C) | s, bid] = \frac{1}{\pi(s)} V_R \quad (2)$$

$$V_P - V_R = \frac{1 - \pi(s)}{\pi(s)} V_R \quad (3)$$
Figure 2A: Target revaluations under deal anticipation.

Expected change in target valuations during the runup ($V_R$), throughout the entire bid process ($V_P$), and the expected markup ($V_P - V_R$)

Benefit function has target and bidder equally sharing synergy gains. Bidder bears a larger share of bid costs. Uncertainty in the signal, $s$, is uniform. Expected markup hits zero when deal is perfectly anticipated.
Figure 2B: Markup projections under deal anticipation.

Projection of $V_P - V_R$ on $V_R$

Benefit function has target and bidder equally sharing synergy gains. Bidder bears a larger share of bid costs. Uncertainty in the signal, $s$, is uniform. Projection hits zero when deal is perfectly anticipated.

Betton, Eckbo, Thompson and Thorburn (2011)
Adding a known target stand-alone value change $T$

- Target runup:

\[ V_{RT} = \pi(s)E_s[B(S, C) + T|s, bid] + [1-\pi(s)]T = V_R + T \] (4)

- Expected final offer and markup at first bid announcement:

\[ V_{PT} = E_s[B(S, C) + T|s, bid] = V_P + T \] (5)

\[ V_{PT} - V_{RT} = \frac{1 - \pi(s)}{\pi(s)}[V_{RT} - T] \] (6)
Figure 3: Markup projections with stand-alone change T in runup. Solid line (Avg.): vertical markup summation across different Ts
Figure 4B: Markup projections with runup feedback

B: Valuation changes with transfer of runup

Revisions in target Valuation
Synergy signal s

\[ \Pi(s) = 1. \]

"Betton, Eckbo, Thompson and Thorburn (2011)"
Deal anticipation with runup fed back into the offer price

**Proposition 3:** The hypothesis that runups caused by deal anticipation are transferred from bidders to targets is rejected by a zero or negative average relation between markups and runups.
### Table 3: Nonlinear projections

<table>
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<th></th>
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<tbody>
<tr>
<td>$V_P - V_R$</td>
<td>$V_R$</td>
<td>$V_P - V_R = a + bV_R$</td>
<td>0.030</td>
<td>0.015</td>
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<tr>
<td><strong>Total markup</strong></td>
<td><strong>Total runup</strong></td>
<td><strong>a = 0.36</strong></td>
<td><strong>b = -0.24</strong></td>
<td><strong>(-11.9)</strong></td>
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<tr>
<td>$\frac{OP}{P_{-2}} - 1$</td>
<td>$\frac{P_{-2}}{P_{-42}} - 1$</td>
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<td></td>
<td></td>
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<tr>
<td><strong>Total markup</strong></td>
<td><strong>Total runup</strong></td>
<td><strong>a = 0.36</strong></td>
<td><strong>b = -0.22</strong></td>
<td><strong>(-10.1)</strong></td>
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<td>$\frac{OP}{P_{-2}} - 1$</td>
<td>$\frac{P_{-2}}{P_{-42}} - 1$</td>
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</tr>
<tr>
<td><strong>Expected markup</strong></td>
<td><strong>Total runup</strong></td>
<td><strong>a = 0.31</strong></td>
<td><strong>b = -0.17</strong></td>
<td><strong>(-9.5)</strong></td>
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<tr>
<td>$\pi[\frac{OP}{P_{-2}} - 1]$</td>
<td>$\frac{P_{-2}}{P_{-42}} - 1$</td>
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</tr>
</tbody>
</table>

Betton, Eckbo, Thompson and Thorburn (2011)
Figure 2B: Markup projections under deal anticipation.

Projection of $V_P - V_R$ on $V_R$

Benefit function has target and bidder equally sharing synergy gains. Bidder bears a larger share of bid costs. Uncertainty in the signal, $s$, is uniform. Projection hits zero when deal is perfectly anticipated.
Figure 5A: Empirical markup projections (using offer prices)
Figure 6A: Projections of bidder gains on target runup without feedback

A: Bidder does not transfer runup $V_R$ to target
Figure 6B: Projections of bidder gains on target runup with feedback and rational bidding

B: Bidder transfers $V_R$ to the target but bids only on beneficial deals (alters the bid threshold $K$)

Bidder expected benefit, $\nu_P$

Target Runup, $V_R$
**Figure 6C:** Projections of bidder gains on target runup with feedback but not rational bidding

C: Bidder transfers $V_R$ to the target but does not alter the bid threshold $K$ (suboptimal behavior).
<table>
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<tr>
<th>Dep var: Bidder CAR[-42,1]</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
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<tr>
<td>Intercept</td>
<td>-0.116</td>
<td>-0.116</td>
<td>-0.110</td>
<td>-0.114</td>
<td>-0.097</td>
<td>-0.099</td>
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<tr>
<td></td>
<td>(0.091)</td>
<td>(0.102)</td>
<td>(0.979)</td>
<td>(0.102)</td>
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<td>Total Target Runup</td>
<td>0.049</td>
<td>0.054</td>
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<tr>
<td>$V_R = \frac{P_{-2}}{P_{-42}} - 1$</td>
<td>(0.006)</td>
<td>(0.003)</td>
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<td>Net Target Runup</td>
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<td>$V_{RT} = \frac{P_{-2}}{P_{-42}} - \frac{M_{-2}}{M_{-42}}$</td>
<td>(0.000)</td>
<td>(0.000)</td>
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<td>Augmented Target Runup</td>
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<td>$V_R = (\frac{P_{-2}}{P_{-42}} - 1) + R_0$</td>
<td>(0.006)</td>
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<td>Market Model Target Runup</td>
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<td>$V_{RT} = CAR(-42,2)$</td>
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<td>0.019</td>
<td>0.049</td>
<td>0.043</td>
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<td>N</td>
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<td>3,689</td>
<td>3,660</td>
<td>3,691</td>
<td>3,624</td>
<td>3,623</td>
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</table>
Figure 6A: Projections of bidder gains on target runup without feedback

A: Bidder does not transfer runup $V_R$ to target

Betton, Eckbo, Thompson and Thorburn (2011)
Figure 7A: Bidder gain on target runup

A: Projections of Bidder Market Model CAR(-42, 1) target runup

Best Linear Fit
Best Fit of Flexible Form
Raw Data

Target Runup from day -42 to day -2

Betton, Eckbo, Thompson and Thorburn (2011)
Conclusions: We show that...

• With deal anticipation, projection of markups on runups is nonlinear
• Empirical projections are nonlinear and consistent with deal anticipation in the runup
• Empirical projections are inconsistent with a transfer of the target runup to the target
• Projections of bidder gains on target runup yield positive slope, as predicted under deal anticipation
• Bidders raise the offer price with the market runup prior to the initial bid
• Toehold acquisitions in the runup period fuel runups but lowers offer premiums