Voluntary Information Dissemination Effects on Stock Returns

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2nd Annual Workshop on Analytics for Business, Consumer and Social Insights
Effects of information dissemination and asymmetry condition

- **Information dissemination effects**
  - the precision of a public disclosure↑ → the magnitude of the pre-announcement price change ↑ & the price reaction to the announcement itself↓ (McNichols and Trueman, 1994)
  - Voluntary information dissemination ~ size, information asymmetry, demand for external capital, and firms’ traditional disclosure reputation (Ettredge et al. 2003)
  - To what extent?

- **Information asymmetry condition**
  - Product innovation → asymmetric situation↓ with stakeholders (Padmanabhan et al. 1997)
    - Product innovation: update, upgrade, or serial product releases
  - Price promotions can imply that the product is less innovative than other rivalry (Srinivasan et al. 2009)
NCsoft Reveals North American Preorder Program Details for Aion
SEATTLE, Wash. – June 17, 2009 – NCsoft®, the world’s premier publisher and developer of massively multiplayer online games (MMOs), today announced ... 2009-06-17  Hrs: 24:35

NCsoft Reveals Limited Collector’s Edition Content for Aion
SEATTLE, Washington – May 28, 2009 – NCsoft®, the world’s premier publisher and developer of massively multiplayer online games (MMOs), today announced ... 2009-05-29  Hrs: 17:01

NCsoft Opens City of Heroes World to Mac Gamers
SEATTLE, January 8, 2009 – NCsoft®, the world’s premier publisher and developer of massively-multiplayer online games (MMOs), today announced the com ... 2009-01-08  Hrs: 17:01

NCsoft Launches City of Heroes Issue 18: Power and Responsibility
Contact: David Swidoff, dswidoff@ncsoft.com, 512 622-8022 Janna Bureson, Jbureson@ncsoft.com, 512 622-8051 SEATTLE, Dec. 3, 2008 – NCsoft®, the world ... 2008-12-04  Hrs: 16:01

Alien: The Tower of Eternity Breaking Beta Test Records in Korea
SEOUL, Korea, Nov. 14, 2009 – One of the most highly anticipated massively multiplayer online (MMO) games, Alien: The Tower of Eternity™ from NCsoft, ... 2009-11-15  Hrs: 22:51

NCsoft West Names Dirk Metzger Vice President of Marketing
SEATTLE, Nov. 13, 2008 – NCsoft®, the world’s premier publisher and developer of massively multiplayer online (MMO) games, has announced that Dirk Met ... 2008-11-14  Hrs: 19:31

NCsoft and TransGaming Announce City of Heroes for the Mac
SEATTLE and TORONTO, Ontario, October 26, 2008 – NCsoft®, the world’s premier publisher and developer of massively multiplayer online games (MMOs), ... 2008-10-31  Hrs: 18:38

NCsoft's Lineage II Expansion Dramatically Speeds Up Character Progression
SEATTLE, October 29, 2008 – NCsoft®, the world’s premier publisher and developer of massively multiplayer online (MMO) games, today announced the ... 2008-10-29  Hrs: 18:39

Search results of PR

One day btw events

Two days btw events
Research questions

How do we measure effects of consecutive daily announcements(events)?

Which type of information will have significant impacts on the stock market?
Revenue of World of Warcraft, ’04–’10

2010 $1.4B
2009
2008
2007
2006
2005
2004 $160M

The development announcement in 2001
Open beta tests started in 2004
Commercialization in the late 2004 (2004/11)
The 3rd extension pack released in 2010

(Source: Hudson Square Research, NCSoft Investment Report, 2010/09)
Online game sector: Game Industry growth rate

<table>
<thead>
<tr>
<th>Period</th>
<th>CAGR</th>
<th>Online</th>
<th>Video</th>
<th>Total market</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003-2012(E)</td>
<td>27%</td>
<td>15%</td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>2008-2012(E)</td>
<td>16%</td>
<td>5%</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>2010-2012(E)</td>
<td>12%</td>
<td>5%</td>
<td></td>
<td>5%</td>
</tr>
</tbody>
</table>

Online game classifications: MMOGs vs. Casual games

**MMOGs have higher entry barrier than casual games because of technological barriers, originality, social/economic systems**

<table>
<thead>
<tr>
<th>MMOGs</th>
<th>Casual Games</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User controls</strong></td>
<td>Keyboard + mouse</td>
</tr>
<tr>
<td><strong>Real time information</strong></td>
<td>Position, to-do list, skills lists, friends information, etc.</td>
</tr>
<tr>
<td><strong>Gaming contents</strong></td>
<td>Various contents in one world</td>
</tr>
<tr>
<td><strong>Easy to play</strong></td>
<td>Needs 30 min to 1 hour at least</td>
</tr>
<tr>
<td></td>
<td><strong>Keyboard or mouse</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Current position (ranking, lap), remaining time/lap, friends position</strong></td>
</tr>
<tr>
<td></td>
<td><strong>One content after selection</strong></td>
</tr>
<tr>
<td></td>
<td><strong>5 min to 30 min</strong></td>
</tr>
</tbody>
</table>
Hypotheses

• H1: an informative press release has positive impacts on the stock price when a firm serves complex product.
  • Under information asymmetry, product innovation → asymmetric situation↓ with stakeholders (Padmanabhan et al. 1997) → increase product performance (revenue)
    • Product innovation: update, upgrade, or serial product releases
  • If a product is simple, there’s no asymmetry situation with stakeholders.

• H2: a promotional press release has negative impacts on the stock price
  • Price promotions can imply that the product is less innovative than other rivalry (Srinivasan et al. 2009)
  • Signaling that a firm is less innovative than others, stakeholders expect the future return will be decreased what product a firm serves.
## Data

- **Unbalanced panel data**
  - Daily basis
  - Duration: 2004-2008
  - Six firms listed in Korean stock markets
  - Press releases from Yonhap News Agency

<table>
<thead>
<tr>
<th>Firm</th>
<th>Title</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCSOft</td>
<td>Lineage1</td>
<td>KOSPI</td>
</tr>
<tr>
<td>ActozSoft</td>
<td>Legend of Mir 2</td>
<td>KOSDAQ</td>
</tr>
<tr>
<td>Webzen</td>
<td>MU Online</td>
<td>KOSDAQ</td>
</tr>
<tr>
<td>Softmax</td>
<td>SD Gundam</td>
<td>KOSDAQ</td>
</tr>
<tr>
<td>YDOnline</td>
<td>Priston Tale 1 Audition</td>
<td>KOSDAQ</td>
</tr>
<tr>
<td>YNKKorea</td>
<td>Rohan Online</td>
<td>KOSDAQ</td>
</tr>
</tbody>
</table>

### 2D MMOG
- Lineage1
- Mir2

### 3D MMOG
- MU online
- Priston Tale 1
- Rohan online

### Casual games
- SD Gundam
- Audition
Model

- Event study cannot capture frequent events’ effects
  - Duplicated abnormal returns
  - Hard to add control variables such as firm size, market size, or
  - Use regression model with dummies to evaluate effects of events (Filson, 2004)
    - Use event window: (-2,1)

- We use the Fixed effect regression model with dummies
  - Set dummy values 1 when dates are within t=-2 and t=1,
    - t=0: event PR release date
    - ev_inno: dummy innovative PR release
    - ev_prom: dummy promotional PR release
  - Control variables: ln(ME), ME/BE, DebtRatio, VacationMonth
  - Measure moderating effect between PR dummies and product type
    - MMOG: set one when product is an MMOG, otherwise zero

\[
    r_{i,t} - r_{free,t} \\
    = \beta_0 + \beta_1 (r_{m,t} - r_{free,t}) + \beta_2 \ln(ME)_{i,t} + \beta_3 \frac{ME_{i,t}}{BE_{i,t}} + \beta_4 \text{DebtRatio}_{i,t} \\
    + \beta_5 \text{VacationMonth}_{t} + \beta_6 \text{MMOG}_{i,t} + \beta_7 \text{ev_inno}_{i,t} + \beta_8 \text{ev_prom}_{i,t} \\
    + \beta_9 \text{ev_inno}_{i,t} \times \text{ev_prom}_{i,t} + \beta_{10} \text{MMOG}_{i,t} \times \text{ev_inno}_{i,t} + \beta_{11} \text{MMOG}_{i,t} \\
    \times \text{ev_prom}_{i,t} + \epsilon_{i,t}
\]
## Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>( r_{m-r_{free}} )</td>
<td>0.925***</td>
<td>0.034</td>
</tr>
<tr>
<td>Vacation_Month</td>
<td>0.003***</td>
<td>0.001</td>
</tr>
<tr>
<td>ln(ME)</td>
<td>-0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>ME/BE</td>
<td>0.001***</td>
<td>0.000</td>
</tr>
<tr>
<td>DebtRatio</td>
<td>-0.002</td>
<td>0.003</td>
</tr>
<tr>
<td>MMOG</td>
<td>0.010***</td>
<td>0.002</td>
</tr>
<tr>
<td>ev_inno</td>
<td>-0.007</td>
<td>0.006</td>
</tr>
<tr>
<td>H2: ev_prom</td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>ev_inno x ev_prom</td>
<td>0.001</td>
<td>0.006</td>
</tr>
<tr>
<td>H1: MMOG x ev_inno</td>
<td>0.009***</td>
<td>0.003</td>
</tr>
<tr>
<td>MMOG x ev_prom</td>
<td>-0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.094***</td>
<td>0.031</td>
</tr>
</tbody>
</table>

*Daily stock returns are determined mainly by market returns*

*H1 supported*  
- Firms which service MMOG has higher stock returns than others

*H2 not supported*
Conclusions

• Results
  • Innovative press releases affect on the stock returns
    • when serviced product is complex
  • Promotional press releases are not significant.
    • Why?

• Limitations
  • Small size of samples: firms and games
    • More data needed to cooperate every serviced games with stock returns

  • Confounding effects on stock returns
    • Financial reports
  • Evolution of online game industries
Any questions?

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