The Effect of Compensation Caps on Risk-Taking

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Presenter: Friedrich Sommer
Compensation Caps and Risk-Taking

In response to excessive risk-taking observed during the financial crisis, lawmakers from the U.S. and Europe focused on compensation caps as an effective means to manage risk-taking [Murphy 2013; Asai 2016]

- The European Commission passed a law that caps performance-contingent compensation to a defined percentage of a manager’s fixed compensation [Capital Requirements Directive IV—European Parliament and the Council 2013]

- Firms in the U.S. that received government funding to prevent bankruptcy during the financial crises were required to implement caps [Garner and Kim 2010]

Prior studies provides evidence that compensation caps were widespread in the business world even before the financial crisis [Murphy 2001; Jansen, Merchant, and van der Stede 2009]

- Murphy (2001) shows that more than 80% of the observed 177 large U.S. companies cap executive bonuses
Position of the Cap: Highest expected value for the firm

Economic theory: Preferences between decision alternatives do not depend on the presence or absence of other decision alternatives or labels (e.g. cap) [Neumann and Morgenstern 2007]

Psychological theory suggests deviation from economic prediction
Setting and research questions

» Research setting:
  – Managers face a decision under risk
  – The compensation is either capped or uncapped
  – Mandatory justification is present or absent

Research questions

» Do capped compensation systems decrease risk-taking overall?

» Does the ex-ante risk preference of managers matter?
  » Does a cap also affect risk-averse managers?

» Does the use of accountability (justification) have an impact on risk-taking?
  » Does the use of accountability lead to improved risk-taking behavior?
  » Does the presence of a compensation cap matter?
Hypothesis 1: Presence of capped compensation system

H1 (replication):  \textbf{Risk taking (cap)} < \textbf{Risk taking (no cap)}

<table>
<thead>
<tr>
<th>Overall effect of caps on risk-taking</th>
</tr>
</thead>
</table>

- While only scarce empirical research on the effectiveness on caps exists the following studies generally confirm that caps reduce risk-taking:
  - Archival Studies:
    - Asai (2016)
    - Jokivuolle, Keppo, and Yuan (2015)
    - Kleymenova and Tuna (2016)
  - Experimental Studies:
    - Hartmann and Slapničar (2015)

These results are in line with rational expectations: When managers reach a compensation cap (or come close to it), taking more risk is irrational as there is no reward for more risk
Hypothesis 2: Risk preferences and level of justification pressure

H2a: \[ \text{Risk taking – RA (cap)} < \text{Risk taking – RA (no cap)} \]

H2b: \[ \Delta \text{Risk taking – RA (cap - no cap; low pressure)} < \Delta \text{Risk taking – RA (cap - no cap; high pressure)} \]

Why does the cap matter for risk averse managers?

- **Compromise effect** – “middle option” appears to be a good compromise between all relevant attributes [Simonson 1989; Tversky and Simonson 1992]

- **Extremeness aversion** – “middle option” appears advantageous [Tversky and Simonson 1992]
  - trade-off between disadvantages & advantages
  - loss aversion – disadvantages are overweighted
    - loss aversion, and therefore extremeness aversion, is stronger the stronger the risk aversion

- Low-risk decisions made without a cap **appear more risky** under a capped compensation contract since high-risk options are removed and the most extreme option available is a medium-risk option
Why does the use of **accountability** matter?

- People strive to **avoid cognitive dissonance** [Festinger 1957], to maintain perceived competence (self-image and self-esteem) [Tetlock 1985] and to avoid regret [Kahneman and Tversky 1981; Samuelson and Zeckhauser 1988]

  - **Compromise effect** [Simonson 1989]: middle option appears to be an acceptable compromise between all the advantages and disadvantages and is the most easily justifiable decision alternative

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**Hypothesis 2: Risk preferences and level of justification pressure**

<table>
<thead>
<tr>
<th>H2a: Risk taking – RA (cap) &lt; Risk taking – RA (no cap)</th>
</tr>
</thead>
</table>

| H2b: \( \Delta \) Risk taking – RA (cap - no cap; low pressure) < \( \Delta \) Risk taking – RA (cap - no cap; high pressure) |

The use of accountability increases the compromise effect and thus leads to even less risk-taking of risk-averse managers.
Summary of hypotheses

H1:
Risk \downarrow

H2a:
Risk \downarrow

H2b:
Risk \downarrow \downarrow
Experimental procedure

Justification pressure: low vs. high
Compensation system: capped vs. uncapped

Recieving Information → Lottery Task → Control Questions → BRET Task → PEQ

ex-ante risk preference

Sprinkle et al. 2008

Crosetto & Filippin 2013
Experimental Design

**Task and treatments**

- **Experimental task:** Bomb Risk Elicitation Task [Crosetto & Filippin 2013]
  - Online experiment, conducted on Amazon MTurk
  - Subjects can collect up to 100 boxes and earn 0.03 USD per box
  - Hidden time bomb in one of the 100 boxes that destroys everything that has been collected up to then (1% risk of getting the bomb per box, e.g. 15 boxes = 15%)
  - Subjects can stop the drawing process at any time
  - Manipulated variables
    - Compensation is **capped** or **uncapped** (no-cap vs. cap)
    - Mandatory decision justification is present or absent (low vs. high pressure)

<table>
<thead>
<tr>
<th>Justification pressure</th>
<th>ex-ante risk preference</th>
<th>uncapped compensation</th>
<th>capped compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>low</strong></td>
<td>low</td>
<td>n = 80</td>
<td>n = 83</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>n = 34</td>
<td></td>
</tr>
<tr>
<td><strong>high</strong></td>
<td>low</td>
<td>n = 85</td>
<td>n = 79</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>n = 34</td>
<td>n = 27</td>
</tr>
</tbody>
</table>
Task: Bomb Risk Elicitation Task [Crosetto & Filippin 2013]
Hypothesis 1: Effect of cap on risk-taking (all subjects)

Test H1: Results of capped compensation on risk-taking of all subjects (ANOVA)

Dependent variable: Number of boxes collected (n = 447)

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>MS</th>
<th>F-Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap</td>
<td>1</td>
<td>1,596.19</td>
<td>8.37</td>
<td>&lt; 0.01a</td>
</tr>
<tr>
<td>Justification</td>
<td>1</td>
<td>512.27</td>
<td>2.69</td>
<td>0.10b</td>
</tr>
<tr>
<td>Cap x Justification</td>
<td>1</td>
<td>488.17</td>
<td>2.56</td>
<td>0.11b</td>
</tr>
</tbody>
</table>

a The p-value is reported on a one-tailed basis, due to the directional hypothesis for this effect.

b The p-value is reported on a two-tailed basis, due to the lack of a directional hypothesis for this effect.

H1: \( \text{Risk taking (cap)} < \text{Risk taking (no cap)} \)
**Hypothesis 2: Effect of cap on risk-taking (only low risk takers)**

**Results**

### Test of H2: Results of capped compensation and justification on risk-taking of low risk-takers

**Panel A: Effect of Type of compensation system and Justification on risk-taking**

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>MS</th>
<th>F-Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap</td>
<td>1</td>
<td>397.79</td>
<td>4.13</td>
<td>0.02</td>
</tr>
<tr>
<td>Justification</td>
<td>1</td>
<td>140.86</td>
<td>1.46</td>
<td>0.23</td>
</tr>
<tr>
<td>Cap x Justification</td>
<td>1</td>
<td>376.94</td>
<td>3.92</td>
<td>0.02</td>
</tr>
</tbody>
</table>

* The p-value is reported on a one-tailed basis, due to the directional hypothesis for this effect.

* The p-value is reported on a two-tailed basis, due to the lack of a directional hypothesis for this effect.

* The contrast coefficients are +1 for no cap/low justification, +3 no cap/high justification, -1 for cap/low justification, and -3 for cap/high justification.

**Panel B: Model contrast on risk-taking**

<table>
<thead>
<tr>
<th>Source</th>
<th>Df</th>
<th>MS</th>
<th>F-Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model contrast</td>
<td>1</td>
<td>682.40</td>
<td>7.09</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>

**Dependent variable: Number of boxes collected (n = 275)**

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Hypothesis 2: Additional analysis – subjects without a target

<table>
<thead>
<tr>
<th># boxes collected (only low risk takers)</th>
<th>H2 (without target): Risk taking – RA (cap) &lt; Risk taking – RA (no cap)</th>
</tr>
</thead>
</table>
| ![Graph](image)                         | Test of H2: Results of capped compensation and justification on risk-taking of low risk-takers without target  

Panel A: Effect of Type of compensation system and Justification on risk-taking

<table>
<thead>
<tr>
<th>Dependent variable: Number of boxes collected (n = 275)</th>
<th>Source</th>
<th>Df</th>
<th>MS</th>
<th>F-Statistic</th>
<th>p-value</th>
<th>H2a:</th>
<th>H2b:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cap</td>
<td>1</td>
<td>3,842.40</td>
<td>21.07</td>
<td>&lt; 0.01</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Justification</td>
<td>1</td>
<td>12.00</td>
<td>0.07</td>
<td>0.80</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cap x Justification</td>
<td>1</td>
<td>530.96</td>
<td>2.91</td>
<td>0.05</td>
<td>✅</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel B: Model contrast on risk-taking

<table>
<thead>
<tr>
<th>Dependent variable: Number of boxes collected (n = 275)</th>
<th>Source</th>
<th>Df</th>
<th>MS</th>
<th>F-Statistic</th>
<th>p-value</th>
<th>H2b:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model contrast</td>
<td>1</td>
<td>4,325.70</td>
<td>23.72</td>
<td>&lt; 0.01</td>
<td>✅</td>
<td></td>
</tr>
</tbody>
</table>

a The p-value is reported on a one-tailed basis, due to the directional hypothesis for this effect.
b The p-value is reported on a two-tailed basis, due to the lack of a directional hypothesis for this effect.
c The contrast coefficients are +1 for no cap/low justification, +3 no cap/high justification, -1 for cap/low justification, and -3 for cap/high justification.
d Low risk-takers without target only include participants who stated "No" when we asked them "Did you aim at earning a specific compensation from the bomb task?".

“Both tradeoff contrast and extremeness aversion are expected to have less impact in situations in which consumers have well-established preferences.”

[Tversky and Simonson 1992, 292]
Wrap-up

We provide evidence that despite rational arguments individuals with a preference for low risk are influenced by the presence of a compensation cap and take less risk than without a compensation cap.

Further, we are able to show that accountability is not a useful tool to improve risk taking behavior for individuals with a preference for risk in the context of a compensation cap.

Limitations

- Only one possible position of the cap considered
- Effect of a compensation system change on risk-taking behavior could be different
Thank you for your attention!

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References

References


