Preparing a negotiated R&D portfolio with a prediction market

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Overview

- R&D Portfolio Management
- Prediction Markets Foundations
- Design Issues
- Evaluation of the Experiments
- Conclusions
R&D Portfolio Management (I)

The R&D project portfolio selection is a **periodic activity**, which aims at **optimizing** the research effort of the company, while enabling it to **select** a portfolio which corresponds to its **strategic objectives** and without **exceeding the resources** available.
• Selecting the right criteria
  – Applicable to all projects
• Collecting the data
  – Lack of concrete information
  – Updating the data
• Negotiating the evaluation
  – Multi-actor or negotiation multi-criteria decision-making process
« Will MICS be renewed for a third phase? »

<table>
<thead>
<tr>
<th>Sell Qty</th>
<th>Price</th>
<th>Buy Price</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>56</td>
<td>56</td>
<td>20</td>
</tr>
<tr>
<td>80</td>
<td>57</td>
<td>53</td>
<td>45</td>
</tr>
<tr>
<td>10</td>
<td>59</td>
<td>50</td>
<td>12</td>
</tr>
<tr>
<td>250</td>
<td>62</td>
<td>42</td>
<td>100</td>
</tr>
</tbody>
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Trading price: M$ 55

If True M$100
If False M$0
Gain: M$45 / contract
Loss: M$ 55 / contract

Never! 55% is too high
It will be true
I’m confident at 60%

I'm confident at 60%
Prediction Markets Foundations (II)

• Selecting the right criteria
  – Implicit comparison criteria
• Collecting the data
  – Aggregate in real time the data
• Negotiating the evaluation
  – Continuous negotiation by the market-maker
Design Issues

• Choice of forecasting goal
  – Claim Description
  – IPO

• Incentives
  – Interface
  – Lack of interest

• Market design
  – Market maker algorithm
A prediction market for R&D should:

• integrate a **standard framework** to support claim formulation
• integrate an easy **IPO mechanism** to support the innovation process
• occult the **financial mechanisms** to reduce the trader's learning curve and increase his incentive
• allow the combination of **group sessions** with individual sessions to increase the incentive of the traders
• integrate an **automatic negotiation agent** i.e. market maker to increase the quality of the evaluation
# Conclusion

Maximizing the value of the portfolio → Achieving a balanced portfolio → Building strategy into the portfolio

## R&D Portfolio Problems

<table>
<thead>
<tr>
<th>R&amp;D Portfolio Problems</th>
<th>Prediction Markets Solutions</th>
<th>Design Propositions</th>
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</table>
| Data collection and actualisation | Reduced to BUY/SELL, contributed by everybody | • Interface design  
• Group sessions |
| Comparison criterion selection | Implicit in BUY/SELL, aggregated in the price | • Claim description  
• IPO process |
| Judgment negotiation | Automatic market making between buyers/sellers | • Automatic Market maker |