Anatomy of grand corruption: A composite corruption risk index based on objective data

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Idea vera debet cum suo ideato convenire

[Spinoza: Ethica; Axiomata VI.]
Outline

• Motivation
• Corruption & grand corruption
• Measurement
• Corruption Risk Index (CRI) & data
• Illustrative results
Motivation
Motivation

- Tools for measuring corruption
- Measurement of political effects (particularism) in public procurement
- Corruption & firm effectiveness
- Corruption & state capacity
Corruption & grand corruption
Corruption & grand corruption

- „abuse of power for private gain”

- Corruption: Holistic vs. Individualistic (Makro vs. Micro) approach
Corruption & grand corruption

\[ C = f (c_1 tr_1, c_2 tr_2, c_k tr_k, \ldots, c_n tr_n) \]

- **C**: weight of corruption
- **c_k**: share of corrupt transactions at \( tr_k \)
- **tr_k**: number of \( k \) type transactions
Corruption & grand corruption

• Corruption: principal-agent-client model

• Corruption:
  – Bribery
  – Extortion
  – Embezzlement
  – Fraud
Corruption & grand corruption

• Mean areas of corruption:
  – Inspections
  – Licences
  – Public procurement
  – Regulation
Corruption & grand corruption

Institutionalised grand corruption in public spending (~particularistic allocation of public resources)

- Institutionalised = recurrent, stable
- Grand = high-level politics and business
- Corruption = particularism
- Public spending = public procurement
Measurement
Measurement

- Perceptions (TI CPI, WB)
- Attitudes (EU ESS)
- Hypothetical situations and actions (EY & GVI)
Measurement

Classical methods:

- Fuzzy (weak reliability)
- Inappropriate
- False
- Impossibility of causal analysis
Measurement

Need for new indicators:

• objective data describing actor behaviour
• micro level
• consistent comparisons across countries, organisations, and time
• thorough understanding of corruption in its context
Corruption Risk Index
CRI

CRI: Corruption Risk Index of the winner selection process in public procurement

• „Risk of corruption” instead of veritable cases of corruption
• Informations from actor behaviour
• A composit indicator
• \(0 \leq \text{CRI} \leq 1\)

• Similar concept: „Red Flags” (OLAF, EU)
CRI – initial

- Single bidder contract
- Call for tender not published in official journal
- Procedure type
- Length of eligibility criteria (in characters)
- Exceptionally short submission period
- Relative price of tender documentation
CRI – initial

- Call for tenders modification
- Exclusion of all but one bid
- Weight of non-price evaluation criteria
- Annulled procedure re-launched subsequently
- Length of decision period
CRI – initial

- Contract modification
- Contract lengthening
- Contract value increase
- Winner's market share
CRI

- Number of bids
- Call for tender not published in official journal
- Procedure type
- Length of eligibility criteria
- Exceptionally short submission period
- Relative price of tender documentation
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Data

Only official sources: administrative data (from HPPA) 1998-2013

Characteristics:

• Low random measurement error: official records, fine attached to errors, many people checking quality (still there are surprising data errors!)

• High systematic error as publications are often gamed for corrupt purposes: we track and analyse errors
Data

- Hungaran data (+ Czech, Slovak, Italian, e.t.c.)
- 2009-2012
- Public procurement announcements: [http://www.kozbeszerzes.hu/](http://www.kozbeszerzes.hu/)
- Data extracted from online text files (i.e. crawler algorithms, text mining algorithms)
- 3.2% of GDP on transaction level
- 300+ variables per transaction
## Data

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of contracts awarded</td>
<td>10918</td>
<td>17914</td>
<td>14070</td>
<td>10342</td>
<td>53244</td>
</tr>
<tr>
<td>Total number of unique winners</td>
<td>3987</td>
<td>5617</td>
<td>5587</td>
<td>4923</td>
<td>13557</td>
</tr>
<tr>
<td>Total number of unique issuers</td>
<td>1718</td>
<td>2871</td>
<td>2808</td>
<td>2344</td>
<td>5519</td>
</tr>
<tr>
<td>Combined value of awarded contracts (million EUR) *</td>
<td>4604</td>
<td>3834</td>
<td>1856</td>
<td>1298</td>
<td>11592</td>
</tr>
</tbody>
</table>

Notes: * = a 300 HUR/EUR uniform exchange rate was applied for exchanging HUF values.
## Data

<table>
<thead>
<tr>
<th>phase</th>
<th>indicator name</th>
<th>indicator definition</th>
</tr>
</thead>
</table>
| submission    | Single bidder contract              | 0=more than one bid received  
1=ONE bid received |
|               | Call for tender not published in    | 0=call for tender published in official journal  
1=NO call for tenders published in official journal |
|               | official journal                    |                                                           |
|               | Procedure type                      | 0 =open procedure  
1=invitation procedure  
2=negotiation procedure  
3=other procedures (e.g. competitive dialogue)  
4=missing/erroneous procedure type |
|               | Length of eligibility criteria      | number of characters of the eligibility criteria MINUS  
average number of characters of the given market's  
eligibility criteria |
|               | Exceptionally short submission      | 0=normal submission period  
1=accelerated submission period  
2=exceptional submission period  
3=exceptional submission period abusing a weekend  
4=missing* |
|               | period                              |                                                           |
|               | Relative price of tender            | price of tender documentation DIVIDED BY contract value |
|               | documentation                       |                                                           |
|               | Call for tenders modification       | 0=call for tenders NOT modified  
1=call for tenders modified |
| assessment    | Exclusion of all but one bid        | 0=at least two bids NOT excluded  
1=all but one bid excluded |
|               | Weight of non-price evaluation      | proportion of NON-price related evaluation criteria  
within all criteria |
|               | criteria                            |                                                           |
|               | Annulled procedure re-launched      | 0=contract awarded in a NON-annulled procedure  
1=contract awarded in procedure annulled, but re-launched |
|               | subsequently***                    |                                                           |
|               | Length of decision period           | number of days between submission deadline and  
announcing contract award |
| delivery      | Contract modification               | 0=contract NOT modified during delivery  
1=contract modified during delivery |
|               | Contract lengthening                | relative contract extension (days of extension/days  
of contract length) |
|               | Contract value increase             | relative contract price increase (change in contract  
value/original, contracted contract value) |
Illustrative results
Results – number of bids
Results

- motivation
- corruption
- measurement
- CRI
- results

average CRI

Per winning bidder

2009-2012

The chart shows the frequency distribution of CRI values over the period 2009-2012.
Results

- Motivation
- Corruption
- Measurement
- CRI
- Results
Results

Profitability and turnover growth of winners, 2009-2012

- Motivation
- Corruption
- Measurement
- CRI
- Results

Profit margin and turnover growth for different CRI categories from 2009 to 2012.
Results

Change of government
Network: 2009-2010

• Spring embedding, CRI, k-cores, weighted
Network: 2011-2012

• Spring embedding, CRI, k-cores, weighted
Thank you for your attention!