The Social Costs of Gambling

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Introduction to the Topic of Social Costs

• Calculation of social costs is a (young) task of economics
• Methodology not matured
• Different concepts lead to different meaning of same terms
• Effect: Misunderstandings and non-comparable studies
• Problems intensified by non-disclosed assumptions and concepts as well as implicitly and ill-defined terms
• Assessment of different costs as “social costs“ often ad-hoc, arbitrary and not well-grounded
• Especially true for studies regarding the social costs of gambling
Methodology: Social Costs of Gambling

- Social costs opposed to social benefits yield effect on welfare
- Social costs as sum of private and external costs
- Monetary externalities have corresponding benefit
- Technological externalities have no corresponding benefit
- Players losses (tangible private costs) equal industry earnings
- Intangible private costs mostly due to gambling addiction
Welfare Effect if Consumers are Rational

- Welfare effect (WE) = Benefits (B) – costs (C)
  - Industry earnings (IE)
  - Consumer benefits (CB)
  - Private Costs (PC)
  - Externalities (EX)
  \[ \text{Welfare effect (WE)} = \text{IE} + \text{CB} - \text{PC} - \text{EX} \]

- If consumers are rational: CB > PC
  - rational consumers completely internalize their costs

- CB - PC = Consumer surplus (CS) \(\rightarrow\) CB = PC + CS
  \[ \text{WE} = \text{IE} + \text{PC} + \text{CS} - \text{PC} - \text{EX} \]
  \[ \text{WE} = \text{IE} + \text{CS} - \text{EX} \]

- Regulation only in relation to negative externalities
Different Views about Rationality

• Rationality is a common assumption in economics
  ➢ „The earth is round, but for most purposes it's sensible to treat it as flat.” (Theodore Levitt)
  ➢ Do „most purposes“ include gambling?
• Three different viewpoints:
  ➢ Classic economist: „People are rational because I assume them to be.“
  ➢ Psychologist: „Rationality? Isn’t that something to eat?“
  ➢ Behavioural economist: „Let’s have a look if people’s behavior can be explained by the assumption of rationality.“
Cues and Consistent Preferences

- Cues are stimuli of the environment, that temporarily increase the marginal utility of a good \( c \).

- "Conditioned response": In the moment of a cue (hot mode), individuals decide to consume because \( U_c > C_c \). Afterwards (cold mode) they may regret their decision.

- Cues temporarily change the preference order (Laibson 2001).

- Individuals are willing to bear huge costs to avoid cues (Laibson 2001).

- This leads to Cue-Management (Schelling 1984).
Discounting and Consistent Preferences

- People discount hyperbolically (Ainslie 1975, Thaler 1981), especially addicted people (Vuchini and Simpson 1998)
- Hyperbolic discounting and addiction are closely linked (Skog 2005)
- Hyperbolic discounting can be modelled best in a utility function based on two systems with different discount rates (McClure et al. 2007)
  - $\beta$-system: high discounting, related to the mesolimbic system
  - $\delta$-system: slow discounting, related to the prefrontal cortex
  - $\beta$-system activated by cues $\rightarrow$ discount rate increases temporarily
Consistent Preferences & Reward Bundling

- Decision bundling can lead to exponential discounting (Ross et al. 2008)

![Diagram showing decision bundling and exponential discounting](image)

- Horizon: amount of bundled decisions
- The greater the path dependency of decisions, the longer the horizon, that is needed for consistent decisions
Addictive goods are highly path dependent

- Path dependent decisions: Utility in the future depends on today's decisions
- Costs of addiction arise in later periods and depend on consumption in earlier periods
- Consumption of addictive goods create so called "consumption capital": The higher the consumption capital, the lower the overall utility and the higher the marginal utility of consumption
- Consumption capital increases with consumption and decreases over time
- Consumption capital in equilibrium: CC*
Do people know the costs of consuming an addictive good?

- Many addicted people start consumption as juveniles
- Cost of addiction varies from person to person
  - Cost of addictions is an unknown to the decision maker (at least in advance)
- Probability of getting addicted varies from person to person
  - Probabilities of getting addicted is an unknown to the decision maker (at least in advance)
- Even if range of costs and range of probability of addiction are known, decision are suboptimal
  - Even with rationality, information deficiency paired with path dependency lead to suboptimal decisions in non-one-shot-games
- Even if people predict everything correctly: Do they bundle their decisions until $t^*$?
Do gamblers evaluate their utility correctly?

- Gamblers overestimate their chances of winning (Weinstein 1980)
  - Illusion of control (Langer and Roth 1975)
  - 75% of all gamblers believe that winnings occur in cycles and events are not independent (Australian Productivity Commission 2009)
  - 32% of all problem gamblers think it is possible to win money consistently (Australian Productivity Commission 2009)

- People overestimate the utility of winning a jackpot
  - People assume the same marginal utility of money as in their current situation
First Resumé

- Gambling is an addictive good
- Cues lead to hyperbolic discounting and therefore to intransitive utility functions and inconsistent decisions
- People, especially addicts, have a too short horizon and do not bundle enough decisions
- People underestimate the costs of addiction
- Gamblers overestimate their marginal utility

→ Gamblers do not internalize their costs completely!
→ What about the welfare effect of gambling?
Social Costs of Gambling: Private costs

- Addicts and non-addicts
  - Players' losses
- Only Addicts:
  - Lost income due to lost jobs
  - Opportunity costs
  - Caused mental disorders (e.g. depression)
  - Caused physical disorders (e.g. increased stress level)
  - Caused substance disorders
  - Change of the brain structure (worse quality of decisions in other areas of life)
  - Costs of Cue-Management
- Costs of addiction mostly intangible!
Social Costs of Gambling: Monetary externalities

- Monetary externalities have a corresponding benefit and no welfare effect
  - Not paid debts
  - Liabilities paid by third parties
  - Increased social transfer
  - Offenses against property to obtain money to gamble (only direct monetary effect)
  - Cannibalization of other industries
Social Costs of Gambling: Technological externalities

- Technological externalities have no corresponding benefit and an effect on welfare
- Technological externalities of pathological gambling
  - Disruption of families and reduced life quality of relatives and friends of pathological gamblers
  - Treatment costs for caused psychic, physical, and substance disorders
  - Productivity losses employer (and in some part society)
  - Increased risk of addiction for children of addicts
  - Debt collecting
  - Costs of procedure of personal bankruptcy
  - Follow-up costs of crimes to obtain money to gamble
  - Deadweight losses of increased redistribution (e.g. social systems)
Social Costs of Gambling: Technological externalities #2

• Technological externalities not related to pathological gambling
  - Costs of lobbying and corruption
  - Costs of regulation of the industry
  - Costs of monitoring the industry
  - Alleviated money laundering
  - Regressive effect of gambling (money goes from poor to rich people)
Challenges to Quantify the Social Costs of Gambling

• Most important costs are intangible
• Intangible costs cannot be measured (Walker 2007, Reith 2007) or are even „Impossible to calculate“ (NGISC 1999)
• Quantifying costs using „willingness to pay“ (highly) speculative
• (Degree of) causality of some effects unknown, e.g. of induced substance disorders
• Insufficient data base
• Until now: No reasonable cost estimation

→ Is there a simple and practical second-best solution?
Option 1: Fraction of Industry Turnover with Problematic Gamblers #1

- How much money is made with pathological gamblers?
  - Most costs relevant to welfare are related to addiction
- Industry earnings are equal to players‘ losses (two sides of the same coin)
- Players‘ losses by interview?
  - Conscious false answers
    - Lying is a diagnostic criterium
  - Unconscious false answers
    - Self-Reporting-Bias
    - Near-winnings not interpreted as losses
  - Gamblers only account for only 13.6% of their losses in interviews

(Productivity Commission 2009)

**People under-report their gambling**

Household Expenditure Survey (HES) 2003–04

<table>
<thead>
<tr>
<th></th>
<th>HES</th>
<th>Reliable data</th>
<th>Share of true value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All gambling</td>
<td>2,204</td>
<td>18,247</td>
<td>13.6</td>
</tr>
<tr>
<td>Lottery/Lotto/scratchies</td>
<td>1,545</td>
<td>1,601</td>
<td>96.5</td>
</tr>
<tr>
<td>EGMs</td>
<td>306</td>
<td>10,651</td>
<td>2.9</td>
</tr>
<tr>
<td>Table games</td>
<td>-56</td>
<td>1,593</td>
<td>..</td>
</tr>
<tr>
<td>Other</td>
<td>410</td>
<td>2,402</td>
<td>17.1</td>
</tr>
</tbody>
</table>
Option 1: Fraction of Industry Earnings with Problematic Gamblers #1

- Calculation of industry earnings per problematic gambler by using the different playing styles
- Pathological gamblers play
  - More often,
  - More intensely,
  - Longer than recreational gamblers

\[
\frac{IE}{\text{probl. Gambler}} = \frac{\text{Share of probl. Gamblers} \times \text{turnover Multiplier}}{\text{Share of probl. Gamblers} \times \text{turnover Multiplier} + \text{Share of recre. Gamblers} \times 1}
\]

- For German slot machines:
  - Share of probl. Gamblers: 11% (Becker 2009)
  - Turnover multiplier (analog Australia): 10.5 (Productivity Commission 2009)

\[
\text{IE/probl. Gambler: } \frac{0.11 \times 10.5}{0.11 \times 10.5 + 0.89 \times 1} = 56.4\%
\]
Option 2: Earnings per Path. Gambler #1

- Variable 1) Industry earnings
- Variable 2) Number of addicts
- Ratio: Industry earnings/number of addicts to evaluate different games
- Interpretation
  - How much earnings are needed to accept one addict?
  - Ranking of games by the earnings which can be generated until one addict arrises (on average)
Option 2: Earnings per path. gambler #2

- Some numbers for Germany

<table>
<thead>
<tr>
<th>Industry</th>
<th>Number of path. gamblers*</th>
<th>Industry earnings per path. gambler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial slot machines</td>
<td>191,680</td>
<td>15,897</td>
</tr>
<tr>
<td>Betting</td>
<td>15,755</td>
<td>28,689</td>
</tr>
<tr>
<td>Casinos</td>
<td>21,006</td>
<td>43,940</td>
</tr>
<tr>
<td>Lotteries</td>
<td>14,044</td>
<td>346,910</td>
</tr>
<tr>
<td>Other</td>
<td>20,090</td>
<td>34,693</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td><strong>262,575</strong></td>
<td><strong>38,062</strong></td>
</tr>
</tbody>
</table>
Summary

• Relevant parameter: welfare effect
  ➢ Social costs have to be opposed to the benefits
• Gambling is an addictive good and the consumers do not internalize all of their private costs
• Many challenges to quantify the social costs of gambling
  ➢ „Degree“ of rationality
  ➢ Quantifying intangible costs
  ➢ Data base
• Meanwhile: Second-best solutions to evaluate different games
  1) Fraction of industry earnings per problematic gambler
  2) Earnings per pathological gambler