1. What is common in fare-dodging, the cold war, corruption, and Edward Snowden’s case?

Snowden’s Case:

<table>
<thead>
<tr>
<th>Individual interest</th>
<th>Collective Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>(his moral conviction)</td>
<td>(national security)</td>
</tr>
</tbody>
</table>

2. ... and when GT doesn’t work properly

Journal of Family Psychology: **Why attractive women match with/marry pain men?**

How to answer the question in GT? → Men in general may follow two strategies:

1. **“Daddy” strategy**: they prefer long relations, is ready to bring up her children.
2. **“Rogue” strategy**: they have many short relations, tend to missteps, and so though women appreciate their look but uncertain about their fidelity and ability to help at home.

The model says something (e.g. it predicts that the fidelity depend on the ratio of men and woman in the considered community), but there is a prejudice in the putative strategies of men: are there only two strategies? All men can be categorized in this way? All hot guys are surely untrue? etc.
GAME THEORY AS SOCIAL THEORY
(A BRIEF SUMMARY)

GT is a mathematical theory, its scope is Strategic Interactions. This means two endeavours:

1. Ontological Req.:
   • Society is supposed to be an ensemble of people having opposed, mixed or similar ambitions (interests) which govern them.

2. How do players think strategically?
   • People work out strategies based on surveying their own opportunities and building up preferences over the set of alternatives.
   • Actions (both individual and collective) based on efficacy (hypothesis of rationality) even if it is not consciously and precisely (conception of bounded rationality).
Epistemic Requirement

- The study always begins with individual actions;
- Any social phenomenon is traced back to individual actions.

Two types of collective actions:

1. **Contingent** (e.g. incidents) – *Weberian Tradition #1*: any macro social phenomenon is conceived as a cumulative effect of individual actions with different motivations.

![Diagram of Contingent Actions]

2. **Regular (repeated) actions** – *Weberian Tradition #2*: how do we get same reply to a set of social actions.

![Diagram of Regular Actions]

To conceive regular actions, we should explore social mechanisms by which social actions are realized.
The sitch of collective actions has specific structural-logical framework, and we can characterize it by GT. We have some Metaphors:

- Zero-sum game: “Matching Pennies” Game
- Prisoner’s Dilemma
- “Invisible Hand” Game

Mechanisms in GT

We make different game situations to consider the intentions of actors and the interdependencies of their choices:

In IR Theory:

- The Cold War
- Security Dilemma
- Perceptual Dilemma

As states acquire capabilities to make themselves secure, they make others more insecure – leads to a cycle of arms races and growing insecurity.

Our viewpoint (EGO): The Others (ALTER):

Security Dilemma Prisoner’s Dilemma

Security TRUST? Threat
Methodological Requirement

We want to give an explanation for macro-micro, micro-macro and micro-macro social processes by Rational Choice Theory.

“20th century biologists prefer to think in terms of mechanisms and not in laws. The reason for this is that the notion of law reserved for physics, which is the only science that can produce explanations with no significant exceptions. […] What is found in biology is mechanisms, mechanisms built with chemical components and are often modified by other, later mechanisms added to an earlier one.”

Francis Circk, 1989

/Nobel laureate in Physiology in 1962, he was the one who discovered the molecular structure of DNA/

Definitions

“A mechanism is a process in a concrete system that is capable of bringing about or preventing some change in the system.”

Mario Bunge, 1997

“A mechanism explains by opening up the black box and showing the cogs and wheels of the internal machinery […] Mechanisms are frequently occurring and easily recognizable causal patterns that are triggered under generally unknown conditions”

Jon Elster, 1989, 1999
There are many types of mechanisms:

- atomic, - biological, - social

Genetic Mechanisms

(drug) side effects of medications

Some Psychological Micro-mechanisms:

1. **Wishful Thinking**: “Build a castle in the sky” $\leftrightarrow$ To be down to the earth
2. **"Sour Grapes" mechanism**: This mechanism is from a famous Aesop’s Tale (http://videa.hu/player?v=OYQMpcfyVWgK05xP)
3. **Compensation**: a psychological mechanism by which an individual attempts to make up for some personal deficiency by developing or stressing another aspect of personality or ability.

The interpretations of basic micro-mechanisms:

1. Psychological micro-mechanisms (Jon Elster)
2. Micro-mechanism based upon situational-logical structure (Karl Popper)
3. Agent-based simulations (Robert Axelrod, Thomas Schelling)
Najat Vallaud-Belkacem, Socialist Politician from France (Minister of Education, Higher Education and Research). She is a young, Maroccan-born woman, and an outspoken defender of gender and racial equality

„I call for respect, and I repeat in particular that racism is not an opinion, but a crime.” (2014)

Is it just a liberal claim or is there any scientific base to say “No to Racism”?

“This is indeed how ideology functions today: nobody takes democracy or justice seriously, we are all aware of their corrupted nature, but we participate in them, we display our belief in them, because we assume that they work even if we do not believe in them”.

Slavoj Žižek: First as Tragedy, Then as Farce

On ideology today – [http://videa.hu/player?v=t1tELbkC4hN5kvsw](http://videa.hu/player?v=t1tELbkC4hN5kvsw)

“Racial Poisoning” (Rassenvergiftung)

"Every crossing between two breeds which are not quite equal results in a product which holds an intermediate place between the levels of the two parents. This means that the offspring will indeed be superior to the parent which stands in the biologically lower order of being, but not so high as the higher parent. For this reason it must eventually succumb in any struggle against the higher species. Such mating contradicts the will of Nature towards the selective improvements of life in general. The favourable preliminary to this improvement is not to mate individuals of higher and lower orders of being but rather to allow the complete triumph of the higher order. The stronger must dominate and not mate with the weaker, which would signify the sacrifice of its own higher nature.”

Adolf Hitler: My Struggle
Lessons from the example:
1. The scope of mechanisms is not universal like that of laws.
2. Micro-level processes are certain, but their effects at macro-level are probabilistic.
3. There are law-governed causal patterns at micro-level (genotype) and plausible effects at macro-level (phenotype).

"Black" and "white" are virtually meaningless descriptors in biology and genetics, because they are social constructs. What makes someone white or black?

Some well-known mixed-race media personnel who "look white":

Most of the hate groups in the world based on racism, and they really commit crime under false belief, like in the witch burning trials in the middle ages.

(On some notorious hate groups: [http://videa.hu/player?v=6dM6plJMdf5VhgSY](http://videa.hu/player?v=6dM6plJMdf5VhgSY)

and witch burning trials by Monty Python: [http://videa.hu/player?v=GlKPnHvMsApT05I9](http://videa.hu/player?v=GlKPnHvMsApT05I9)
In the summer of 1990, Norwegian media reported that women more often than men were stung by wasps.

What could explain the skewed sex ratio in wasp bites?

#1: The Rambo Theory

Women are tender than men. Boys don’t cry, and so a real man it would be disgracefully effeminate to call a doctor for a dinky distress.

*Sociologic explanation ↷ norms for men*

#2: The Outdoors Theory

Women spend more time in the open air than men, walking their babies and playing their children.

*Sociologic explanation ↷ norms for women*

#3: The Scent Theory

Women use more hairspray and perfumes. The fragrances attract wasps, but after they discovered that the source of scent is not a flower, they react to frustration by agression.

*Ethological explanation ↷ behav of wasps*
**THE ROLE OF MECHANISMS**

**D-N Explanation** is a general law (like theorems in maths or laws in physics), and it goes in the way of syllogisms

All men are mortal  
All Greeks are men  
________________________  
All Greeks are mortal

All M are P  
All S are M  
________________________  
All S are P

**I-P Explanation**

- Inductive explanation cannot be certain
- How long should we collect empirical data to make an explanation?

**Example:**

In a hospital there are many sick persons with food poisoning.

“A” ate:  
“B” ate:  
“C” ate:

a, b, c, d  
b, d, e, f, g  
d, f, h

Conclusion: The cause of poisoning could be “d” because “d” appeared in any case when people had fallen in sick independently of circumstances.

**Counter-Example:**

<table>
<thead>
<tr>
<th>Rum + Pizza + Sitting $\rightarrow$ Headache</th>
<th>Rum + Soda Water $\rightarrow$ Headache</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rum + Hot-dog + Standing $\rightarrow$ Headache</td>
<td>Vodka + Soda Water $\rightarrow$ Headache</td>
</tr>
<tr>
<td>Rum + Salty Sticks + Laying $\rightarrow$ Headache</td>
<td>Tequila + Soda Water $\rightarrow$ Headache</td>
</tr>
</tbody>
</table>
| Conclusion: Rum causes a headache | Conclusion: Soda causes a headache???

**Mechanisms:** They are

- between D-N and I-P explanations  
- not certain (like theorems or laws), but definite and plausible.

**In GT to make mechanisms is game engineering.**

We make different game situations to consider the intentions of actors and the interdependences of their choices. The goal of game engineering is to estimate the possible strategies of players, and to find a game to the different strategies in which they result in equilibrium.
What is Rational Choice Theory?

RCH is a generalization of GT, and there is a close connection between them:

**Decision Sitch:**
- Decision maker
- Alternatives
- Preferences

**Game Sitch:**
- Players
- Strategies
- Payoffs

The analysing levels of Rational Choice Theory

1. **Subintentional Level**: to explain the formation and the alteration of preferences by mechanisms.

2. **Intentional Level**:

   ![Intentional Level Diagram]

   - Intentions
   - Mechanisms
   - Actions
   - Method.
   - Individ.
   - Social Phenomena

3. **Interaction Level** (including Game Theory): The goal is to explain interactions with intentions. Based on the putative and real preferences of actors, and supposing they do not want to come off badly, we make an attempt to describe and to grasp the logic of the situation, and to predict the expected outcome.

4. **Superintentional Level**: Consequences going beyond the intentions of the actors.
EXPECTED UTILITY THEORY

Expected Utility Theory:

- **Payoffs**
  - Zero-sum game: *number*
  - Non-constant-sum game: *vector*

- **Mixed strategies: vectors**

  For Row Player: \((x_1, x_2)\)

  \[ x_1 + x_2 = 1 \]

  \[ 0 \leq x_1, x_2 \leq 1 \]

  For Column Player: \((y_1, y_2)\)

  \[ y_1 + y_2 = 1 \]

- **Payoff Matrix: matrix**

---

The mathematical levels of abstraction:

- **Number** \(\rightarrow\) **Vector** \(\rightarrow\) **Matrix**
Decision rules for making rational decisions:

The general scheme of rational decisions:
Fixed preferences + Decision Rule $\rightarrow$ Rational Decisions $\rightarrow$ Actions.

Example:

<table>
<thead>
<tr>
<th>Asset: $1000</th>
<th>Econ. State #1</th>
<th>Econ. State #2</th>
<th>Econ. State #3</th>
<th>Min Row</th>
<th>Max Row</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposit</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
<td>1100</td>
</tr>
<tr>
<td>Stock</td>
<td>1000</td>
<td>1100</td>
<td>1200</td>
<td>1000</td>
<td>1200</td>
</tr>
<tr>
<td>Gold</td>
<td>1600</td>
<td>300</td>
<td>1400</td>
<td>300</td>
<td>1600</td>
</tr>
</tbody>
</table>

Maximin (Wald) Criterion: $\max\{\min\{\text{Row}\}\} = 1100 \rightarrow \text{Deposit}$

$\rightarrow$ It describes a risk-averse behaviour of the DM.

Maximax Criterion: $\max\{\max\{\text{Row}\}\} = 1600 \rightarrow \text{Gold}$

$\rightarrow$ It describes a risk-taker behaviour of the DM.

Opportunity cost: $\min\{\max \text{of row (opportunity costs)}\} = 500 \rightarrow \text{Deposit}$

$\rightarrow$ It means the value of the best alternative forgone.

Opportunity costs:

<table>
<thead>
<tr>
<th>Asset: $1000</th>
<th>Econ. State #1</th>
<th>Econ. State #2</th>
<th>Econ. State #3</th>
<th>Max Row</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deposit</td>
<td>500</td>
<td>0</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>Stocks</td>
<td>600</td>
<td>0</td>
<td>200</td>
<td>600</td>
</tr>
<tr>
<td>Gold</td>
<td>0</td>
<td>800</td>
<td>0</td>
<td>800</td>
</tr>
</tbody>
</table>

Bayes’s Rule: Expected utilities $\rightarrow$ $EU = \sum v x p$

EU (Deposit) = $1/3 \times (1100) + 1/3 \times (1100) + 1/3 \times (1100) = 1100$

EU (Stocks) = $1/3 \times (1000) + 1/3 \times (1100) + 1/3 \times (1200) = 1100$

EU (Gold) = $1/3 \times (1600) + 1/3 \times (300) + 1/3 \times (1400) = 1100$
Bayes’s Rule

\[ P = x_i \times y_j \]

\[ EU = \sum v_{ij} \times p \]

**EUs for Row Player (EGO):**

\[ EU (D) = x_1 v_{11} y_1 + x_1 v_{12} y_2 \]

\[ EU (C) = x_2 v_{21} y_1 + x_2 v_{22} y_2 \]

**EUs for Column Player (Alter):**

\[ EU (D) = x_1 v_{11} y_1 + x_2 v_{21} y_1 \]

\[ EU (C) = x_1 v_{12} y_2 + x_2 v_{22} y_2 \]
"MATCHING PENNIES" GAME
AS ZERO-SUM GAME

<table>
<thead>
<tr>
<th>Pure str.:</th>
<th>H</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed str.:</td>
<td>( \frac{1}{4} ) or 25%</td>
<td>( \frac{1}{4} ) or 75%</td>
</tr>
</tbody>
</table>

\[
EU = \begin{cases} 
1 & \text{row chosen} \\
3 & \text{column chosen} 
\end{cases}
\]

Mixed strategy:

\[
x_1 = \frac{1}{4} \quad x_2 = \frac{3}{4}
\]

In a 4-round game

In Probability:

\[
In \ Odds: \quad 1 \text{ to } 3
\]

The Goal of Players:

Row Player (Pl. A):

\[
\text{max}_{\text{row}} \text{min}_{\text{col}} \text{ } EU = v
\]

Column Player (Pl. B):

\[
\text{min}_{\text{col}} \text{max}_{\text{row}} \text{ } EU = \bar{v}
\]

The EU of Column Player's strategies:

\[
D \rightarrow h \\
C \rightarrow t
\]

\[
EU (D) = x_1 v_{11} + x_2 v_{21} = v (h|H) \frac{1}{4} + v (h|T) \frac{3}{4} = \frac{1}{2}
\]

\[
EU (C) = x_1 v_{12} + x_2 v_{22} = v (t|H) \frac{1}{4} + v (t|T) \frac{3}{4} = -\frac{1}{2}
\]

\[
x_1 = \frac{1}{4} \quad x_2 = \frac{3}{4}
\]

Minimax Theorem:

\[
v \leq \bar{v}
\]

If \( v = \bar{v} \), there exists an equilibrium strategy.
GAMES AND INFORMATION

\[
\begin{array}{ccc}
\omega_1 & \omega_2 & \omega_3 \\
X_1 & C_{11} & C_{12} & C_{13} \\
X_2 & C_{21} & C_{22} & C_{23} \\
\end{array}
\]

- \(X_1\): take an umbrella
- \(X_2\): do not take
- \(\omega_1\): It’s raining
- \(\omega_2\): It’s cloudy
- \(\omega_3\): The sun is shining

**Primary mind** – what player thinks (\(K_{\text{Ego}}(\text{Fact})\))

**Secondary mind** – what player thinks about what the other thinks (\(K_{\text{Ego}}K_{\text{Alter}}(\text{Fact})\))

Hipster mouse: "You can see that he knew that we had known who he was.”

**Third mind** – \(K_{\text{Ego}}K_{\text{Alter}}K_{\text{Ego}}(\text{Fact})\)

Female mouse: "The question is, does he know that we knew that he had known that we had known...”

Reaction (the Boss mouse): “Cut the crap or I’ll go nuts”

**Common knowledge** – Primary mind plus secondary mind plus third mind, and so forth.

**US Secretary of Defense, Donald Rumsfeld and the "unk-unk" problems:** a problem about the lack of evidence linking the government of Iraq with the supply of weapons of mass destruction to terrorist groups. Rumsfeld stated: "Reports that say that something hasn't happened are always interesting to me, because as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don’t know we don't know.” (http://videa.hu/player?v=VnOdqizx4WsHdaAS)
**Perfect Information** – is a game in which players have all structural and factual knowledge (all the relevant information) by which they are in principle able to make a rational decision.

**Imperfect Information** – is a simultaneous move game where players’ structural knowledge is the same (they know all the possible outcomes), but their factual knowledge is imperfect (related to playing the game).

**Complete Information** – If the players’ knowledge is partial, i.e., their structural and factual knowledge is identical in a part of the game (called Subgame), but the extension of this knowledge to the whole game is possible only heuristically in inductive way, with some missing factual knowledge needed.

**Incomplete Information** – is a situation under asymmetric information in which players’ both structural and factual knowledge is different.
**SADDLE POINT**

- Local Maximum
- Saddle Point
- Local Minimum

Add 2 surfaces
Saddle-point construction

- NESP $N+2$ surfaces
- Local minimum I $N+2$ surfaces
- Rolling down
- Local minimum II $N+2$ surfaces

---

### Company B

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Row Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>2</td>
<td>1</td>
<td>-5</td>
<td>-2</td>
</tr>
<tr>
<td>Company B</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>-2</td>
</tr>
</tbody>
</table>

Max Min = Min Max

2 - 2
They float trees on the river, but to avoid microorganisms induced by water, they cover the trees some impregnated stuff. The trouble is that it is going into the water, and this is a bad advertising for anglers and tourists.

**Proposals (2x2):**

<table>
<thead>
<tr>
<th></th>
<th>#1:</th>
<th>#2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP.</td>
<td>300.000</td>
<td>500.000</td>
</tr>
<tr>
<td>H</td>
<td>500.000</td>
<td>300.000</td>
</tr>
</tbody>
</table>

**Transaction Cost** (in most general sense): the cost of exchange.

<table>
<thead>
<tr>
<th></th>
<th>Lower</th>
<th>Higher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standardized goods/services</td>
<td>Unique goods/services</td>
<td></td>
</tr>
<tr>
<td>Clear, simple rights</td>
<td>Uncertain, complex rights</td>
<td></td>
</tr>
<tr>
<td>Few parties</td>
<td>Many parties</td>
<td></td>
</tr>
<tr>
<td>Friendly (familiar) parties</td>
<td>Hostile (unfamiliar) parties</td>
<td></td>
</tr>
<tr>
<td>Reasonable behaviour</td>
<td>Unreasonable behaviour</td>
<td></td>
</tr>
<tr>
<td>Prompt exchange</td>
<td>Delayed exchange</td>
<td></td>
</tr>
<tr>
<td>Low costs of monitoring</td>
<td>High costs of monitoring</td>
<td></td>
</tr>
<tr>
<td>Cheap punishment</td>
<td>Costly punishment</td>
<td></td>
</tr>
</tbody>
</table>
INTERTEMPORAL DECISIONS

(Real) Interest rate rate (r) – October, 2014:

<table>
<thead>
<tr>
<th>Name of interest rate</th>
<th>country/region</th>
<th>current rate</th>
<th>direction</th>
<th>previous rate</th>
<th>change</th>
</tr>
</thead>
<tbody>
<tr>
<td>American interest rate FED</td>
<td>United States</td>
<td>0.250 %</td>
<td>↓</td>
<td>1.000 %</td>
<td>12-16-2008</td>
</tr>
<tr>
<td>Australian interest rate RBA</td>
<td>Australia</td>
<td>2.500 %</td>
<td>↓</td>
<td>2.750 %</td>
<td>08-06-2013</td>
</tr>
<tr>
<td>Banco Central interest rate</td>
<td>Chile</td>
<td>3.000 %</td>
<td>↓</td>
<td>3.250 %</td>
<td>10-16-2014</td>
</tr>
<tr>
<td>Bank of Korea interest rate</td>
<td>South Korea</td>
<td>2.000 %</td>
<td>↓</td>
<td>2.250 %</td>
<td>10-15-2014</td>
</tr>
<tr>
<td>Brazilian interest rate BACEN</td>
<td>Brazil</td>
<td>11.000 %</td>
<td>↑</td>
<td>10.750 %</td>
<td>04-02-2014</td>
</tr>
<tr>
<td>British interest rate BoE</td>
<td>Great Britain</td>
<td>0.500 %</td>
<td>↓</td>
<td>1.000 %</td>
<td>03-05-2009</td>
</tr>
<tr>
<td>Canadian interest rate BOC</td>
<td>Canada</td>
<td>1.000 %</td>
<td>↑</td>
<td>0.750 %</td>
<td>09-08-2010</td>
</tr>
<tr>
<td>Chinese interest rate PBC</td>
<td>China</td>
<td>6.000 %</td>
<td>↓</td>
<td>6.310 %</td>
<td>07-06-2012</td>
</tr>
<tr>
<td>Czech interest rate CNB</td>
<td>Czech Republic</td>
<td>0.050 %</td>
<td>↓</td>
<td>0.250 %</td>
<td>11-01-2012</td>
</tr>
<tr>
<td>Danish interest rate Nationalbanken</td>
<td>Denmark</td>
<td>0.200 %</td>
<td>↓</td>
<td>0.300 %</td>
<td>05-02-2013</td>
</tr>
<tr>
<td>European interest rate ECB</td>
<td>Europe</td>
<td>0.050 %</td>
<td>↓</td>
<td>0.150 %</td>
<td>09-04-2014</td>
</tr>
<tr>
<td>Hungarian interest rate</td>
<td>Hungary</td>
<td>2.100 %</td>
<td>↓</td>
<td>2.300 %</td>
<td>07-22-2014</td>
</tr>
<tr>
<td>Indian interest rate RBI</td>
<td>India</td>
<td>8.000 %</td>
<td>↑</td>
<td>7.750 %</td>
<td>01-28-2014</td>
</tr>
<tr>
<td>Indonesian interest rate BI</td>
<td>Indonesia</td>
<td>7.500 %</td>
<td>↑</td>
<td>7.250 %</td>
<td>11-12-2013</td>
</tr>
<tr>
<td>Israeli interest rate BOI</td>
<td>Israel</td>
<td>0.250 %</td>
<td>↓</td>
<td>0.500 %</td>
<td>08-25-2014</td>
</tr>
<tr>
<td>Japanese interest rate BoJ</td>
<td>Japan</td>
<td>0.100 %</td>
<td>↓</td>
<td>0.100 %</td>
<td>10-05-2010</td>
</tr>
<tr>
<td>Mexican interest rate Banxico</td>
<td>Mexico</td>
<td>3.000 %</td>
<td>↓</td>
<td>3.500 %</td>
<td>06-06-2014</td>
</tr>
<tr>
<td>New Zealand interest rate</td>
<td>New Zealand</td>
<td>3.500 %</td>
<td>↑</td>
<td>3.250 %</td>
<td>07-24-2014</td>
</tr>
<tr>
<td>Norwegian interest rate</td>
<td>Norway</td>
<td>1.500 %</td>
<td>↓</td>
<td>1.750 %</td>
<td>03-14-2012</td>
</tr>
<tr>
<td>Polish interest rate</td>
<td>Poland</td>
<td>2.000 %</td>
<td>↓</td>
<td>2.500 %</td>
<td>10-08-2014</td>
</tr>
<tr>
<td>Russian interest rate CBR</td>
<td>Russia</td>
<td>8.000 %</td>
<td>↑</td>
<td>7.500 %</td>
<td>07-25-2014</td>
</tr>
<tr>
<td>Saudi Arabian interest rate</td>
<td>Saudi Arabia</td>
<td>2.000 %</td>
<td>↓</td>
<td>2.500 %</td>
<td>01-19-2009</td>
</tr>
<tr>
<td>South African interest rate SARB</td>
<td>South Africa</td>
<td>5.750 %</td>
<td>↑</td>
<td>5.500 %</td>
<td>07-17-2014</td>
</tr>
<tr>
<td>Swedish interest rate Riksbank</td>
<td>Sweden</td>
<td>0.250 %</td>
<td>↓</td>
<td>0.750 %</td>
<td>07-03-2014</td>
</tr>
<tr>
<td>Swiss interest rate SNB</td>
<td>Switzerland</td>
<td>0.250 %</td>
<td>↓</td>
<td>0.500 %</td>
<td>03-12-2009</td>
</tr>
<tr>
<td>Turkish interest rate CBRT</td>
<td>Turkey</td>
<td>8.250 %</td>
<td>↓</td>
<td>8.750 %</td>
<td>07-18-2014</td>
</tr>
</tbody>
</table>

FED interest rates, long-term

Bank of England interest rates, long-term
Present Value (PV) Calculation:

PV\(_0\) = $1

PV\(_1\) = $1 \times d = $0.9804

PV\(_2\) = $1 \times d^2 = $0.9612

PV\(_3\) = $1 \times d^3 = $0.9424

...........

PV\(_n\) = ($1 \times d) \times d \times d \times \ldots \times d = $1 \times d^n

r = 0.02 \leftarrow 2\% \text{ (Poland or South Korea, 2014)}

d = \frac{1}{1+0.02} = \frac{1}{1.02} = 0.9804
Rationality: what is it exactly?

**Substantive Rationality:**
- self-interest behaviour, adaptation by interaction

Wacky Wasp?

**Procedural Rationality:**
- pattern-follower, adaptation by rule

Ultimatum Game

The persons interact to decide how to divide a sum of money that is given to them. The first give a proposal about the distribution, the second decides either accepts it or not. If the second rejects, neither player receives anything. Experimental result: all offers of less than 20% are often rejected.

**Bewildering behaviour of wasps**

Ingenious Wasp?

**Wacky or Proud Humans?**

Is there any natural law base of homosexuality?
Since among some animals, such as Bonobo monkeys there exists same-sex sexual behaviour, shouldn’t we claim that homosexuality has natural law value?

Those saying “yes, it is”: their beliefs are based upon substantive rationality; that the whole business of sexuality goes back to basic instinct.

Those saying “No”: although admitting sexuality based upon instinct but in a procedural fashion (the goal of sexuality is eventually to uphold humankind)

Oral Sex has an increasing trend among teens from 1980s. Explanation?
#1: Fashion, too much porn via media ← procedural rationality
#2: Sexual infections (AIDS, Hepatitis), stricter abortion laws in many states ← substantive rationality

**Traditional (Neumann-Nash) Game Theory**
Substantive Rationality

**Applications:**

#1: Who cares of offsprings (only the male, only the female, both of them, or none of them)?

#2: Why is it worth playing rituals in evolutionary sense?

#3: The Paradox of Rational Voter (Downs paradox)?
It is non-rational at all for a rational, self-interested voter to vote, because the costs of voting will normally exceed the expected benefits. → Renormalized Rationality or Superrationality

**Evolutionary Game Theory:**
Procedural Rationality

Population:
An ensemble of players acting similarly due to playing the same strategy