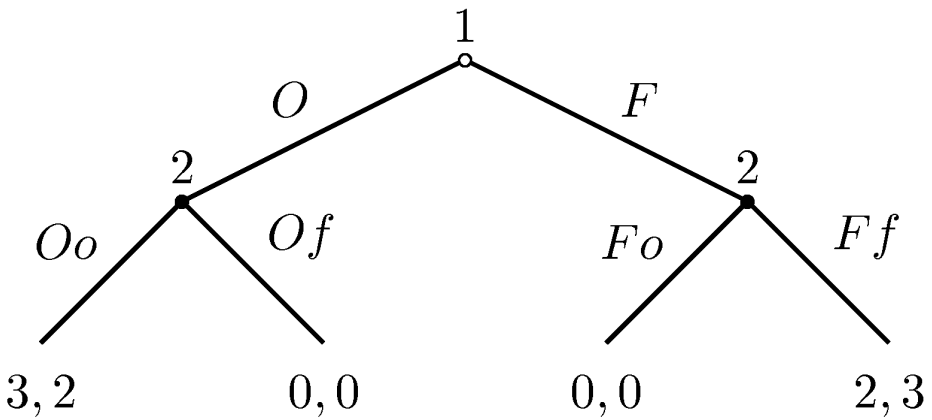
C3: Strategic Interaction and Incentives for Sustainable Economic Activity

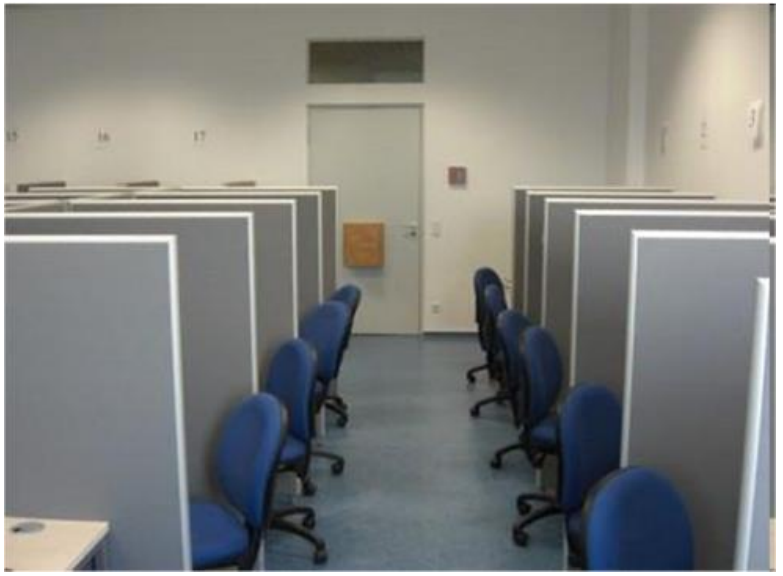
- Goal: identify and understand incentive problems that may otherwise impede a successful implementation and management of sustainable production networks.

- Approach: the research is carried out using two complementary methods.

  - **Game Theoretic Analysis**: examine the interplay between incentives, strategic behavior and sustainability using mathematical modelling.

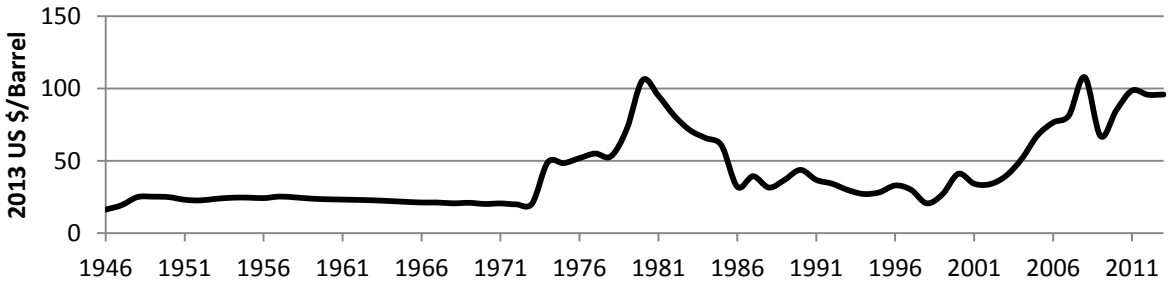


  - **Laboratory Experiments**: test predictions from game theory and examine how agents actually behave in settings related to sustainability.



Results 2014

- **WP1: The common pool problem and the regeneration of the resource**
  - Challenge: according to Hotelling's rule, the prices of non-renewable resources (e.g. oil, coal) should grow at the rate of interest, but in reality they have not increased reliably.
  - Laboratory Experiment:
    - Test of the dynamic and strategic aspects of production with a limited resource in a duopoly.
    - Hypothesis: the larger the stock size, the less attention producers will pay to the dynamic, and the more attention they will pay to the strategic aspect.
    - Findings: if the stock of the resource is large, producers care less about the dynamic optimization aspect → the Hotelling rule fails, whereas it describes the data well if the stock is low; on average behavior is not far from what is predicted by the Nash-solution.



Sustainable MANUFACTURING

Results 2014

- ***WP2: Voluntary commitments to sustainability***

- Under which conditions do firms *voluntarily* commit themselves to higher environmental and social standards than the legally binding ones? (E.g., commitments to a maximum carbon emissions level for certain types of cars)
- Over-compliance may help companies to better satisfy consumers' tastes for sustainability, thereby preventing collective action such as boycotts.
- For firms anticipating the long-term consequences of their actions, such as the reactions of regulatory agencies or consumers, voluntary self-restrictions can become profit-maximizing.

- Results: In lab experiments, firms learn to choose costly standards for strategic reasons. Adopting sustainable technologies leads to increased profits for the firms.

Results 2014

- ***WP3: Coordination problems in sustainable value creating networks***

- How can coordination problems be solved that can play a role even if the actors share the common goal of implementing sustainable production processes in their network?
- For example, suppose that sustainability standards of production need to be implemented by all members of a value creating network. If a critical mass of agents does not implement the new production standard, then the goal of the entire group is not reached (e.g., a prize or a notification for an especially environmentally friendly product).

- Experimental Results:
  - History of initial coordination does not make subsequent coordination more likely.
  - People underestimate the value of communication, coordination and cooperation.
- For value creation networks to function effectively, it may be important to emphasize the importance of coordination to its members.