IREGE
INSTITUT DE RECHERCHE EN GESTION ET ECONOMIE

12/11/2026 - 12H15 - SALLE 103

Séminaire de Recherche



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Strategic Nuclear Investments: Theory and Evidence

Nuclear energy use varies widely across European countries with similar economic and technological characteristics. The present research aims to partly explain why. Using parliamentary debates from 1960 to the present in France and Germany, I show that countries are very different in the debates across time. France and Germany strategically interact to plan their future nuclear energy policy, in an asymmetric fashion; German policymakers anticipate relying on French nuclear production to support a domestic phase-out after the 2011 Fukushima Daiichi nuclear disaster, while French policymakers internalize this dependence. Moreover, France seems less risk averse than Germany. To rationalize these findings, I develop a model in which two identical countries form beliefs about nuclear power riskiness and make nuclear investment decisions under uncertainty while strategically interacting. Moreover, countries can trade nuclear electricity. The model extends a two-armed bandit framework from Keller, Rady and Cripps. In contradiction with previous literature, I find that if countries are perfectly symmetric, the unique Markov perfect Equilibrium (MPE) is the symmetric one. When countries are semi-symmetric i.e. asymmetric in the risk aversion rate only, then two major results arise: MPE are asymmetric and trade matters. The MPE with trade produces curves matching well the strategies of France and Germany in real data.