

SEQUENTIAL INVESTMENT IN EMERGING TECHNOLOGIES UNDER RISK-AVERSION AND POLICY UNCERTAINTY

By [Lars H. Sendstad](#) and [Michail Chronopoulos](#)

EU GUIDANCE FOR SUBSIDIES

EU GUIDANCE FOR SUBSIDIES

- Financial support for renewables should be limited and aim to make renewables competitive

EU GUIDANCE FOR SUBSIDIES

- Financial support for renewables should be limited and aim to make renewables competitive
- Support schemes should be flexible and respond to falling production costs

EU GUIDANCE FOR SUBSIDIES

- Financial support for renewables should be limited and aim to make renewables competitive
- Support schemes should be flexible and respond to falling production costs
- Unannounced or retroactive changes to support schemes should be avoided

OBJECTIVE

OBJECTIVE

- How does policy uncertainty impact an investment decision?

OBJECTIVE

- How does policy uncertainty impact an investment decision?
- How does technological uncertainty interact with policy uncertainty?

OBJECTIVE

- How does policy uncertainty impact an investment decision?
- How does technological uncertainty interact with policy uncertainty?
- When should a firm adopt new versions of a technology under price, policy, and technological uncertainty?

A world map with a dark blue background, where the landmasses are outlined in a lighter blue. The map is covered with a dense pattern of small, bright yellow and white dots, representing city lights or population density. The text "POLICY UNCERTAINTY" is overlaid in the center in a bold, white, sans-serif font.

POLICY UNCERTAINTY

POLICY UNCERTAINTY: NORWAY

- Data centers were considered a source of high skilled jobs
- Quote

POLICY UNCERTAINTY: SPAIN

- Promises of 10% annual return on Solar projects
- Several cuts resulting in 40% subsidy reduction according to one firm

POLICY UNCERTAINTY: EASTERN EUROPE

- Eastern Europe has had a fast-growing PV market
- Several of these countries to reach their 2020 EU targets for RE ahead of time
- End users and energy companies have footed the bill
- Czech policymakers have restricted feed-in tariffs and started levying a windfall tax

TECHNOLOGICAL UNCERTAINTY INTRODUCTION

- Fast pace of innovation
- Difficult to sustain competitive advantage

A photograph of an offshore wind farm with numerous wind turbines stretching across a blue sea under a cloudy sky. The turbines are white with three blades each, and their foundations are visible in the water. The sky is filled with soft, white clouds, and the sea is a deep blue.

VESTA

- Failing wind turbine business in 2012
- Restructuring and cooperation
- Entered into off-shore wind turbines
- Regained position as world leader

OBJECTIVES REVISITED

- Based on the examples from Spain and Eastern Europe (Norway?), political stability seems to be important
- Technological uncertainty presents opportunities

RELATED WORK: POLICY UNCERTAINTY

- Boomsma & Linnerud (2015)
 - Policy Uncertainty might
- Adkins & Paxson (2015)
 - Policy Uncertainty might

RELATED WORK: POLICY UNCERTAINTY

- Boomsma & Linnerud (2015)
 - Policy Uncertainty might
- Adkins & Paxson (2015)
 - Policy Uncertainty might
- Yet they do not consider technological uncertainty

ASSUMPTIONS

•

POLICY UNCERTAINTY

- The time between each policy intervention is exponentially distributed
- $\lambda_i \geq 0$ denotes the intensity of the Poisson process

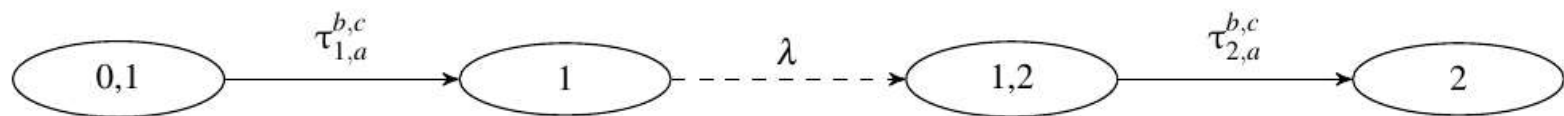


Fig. 1 State transition diagram

A man with a beard, wearing a white dress shirt and a striped tie, is seated at a desk. He has a wide-eyed, open-mouthed expression of surprise or excitement. He is looking towards the left side of the frame. In the foreground, the back of another person's head and shoulders are visible; they are wearing a red shirt and are seated in a dark blue office chair. The background is a plain, light-colored wall. The text "THANK YOU!" is superimposed in white, bold, sans-serif capital letters across the center of the image.

THANK YOU!

THANK YOU!