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# **R&D PRODUCTIVITY, SPILLOVERS AND EFFECTIVE PATENT LIFE**

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# Objectives

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- **Analysis of the role of increasing delays from patent time to launch time in the market value of patents and incentives to innovate.**
  - Reduction of the effective patent life
  - Sales turnover and follow-on competition
- **Key concept of the analysis: EPL**
- **Assessment: Very revealing paper, but can they do more? (note: the response is always yes)**

# Model, data and method.

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- Modelling strategy (Cabral, 1993): Three models of increasing complexity
  - M1: Patent exclusivity
  - M2: Between patent competition without spillovers
  - M3: Between patent competition with knowledge spillovers
- Data: CERM database on the activities within the pharmaceutical industry. Very rich data set.
- Method: Duration analysis (with some caveats)

# Main Results

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- R1: The R&D productivity slowdown (organizational and regulatory complexity, increased number of available trajectories) is driving up EPL1
- R2: EPL2 is positively affected by increased complexity (it affects all products), whereas knowledge spillovers exert a negative effect
- R3: Sales erosion
  - First mover advantage
  - Increased price competition in latest years

# Some comments, mostly empirical (in no particular order)

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- Weak link between the models and the empirical evidence
- Time from patent to effective entry and time from innovator launch to follower entry are likely not to be independent. Suggestion: multivariate duration model(?)
- Likely measurement error in some variables.
- Role of prices in the model and/or empirical evidence (specially table 4?)
- It is hard to believe that the entry country has no effect in any of the specifications.
- In the 2nd/3rd models entrant prices maybe relevant (and it can be a time varying regressor).

# Some comments

## (in no particular order)

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- “The results presented in this paper pose concerns regarding the incentives for undertaking R&D activities on the side of the firms”
- **However:**
  - Increased price competition in latest years: is it bad or good for consumers?
- **Furthermore:**
  - Are spillover effect good or bad for the economy?
    - For consumers?

# Suggestions for further work

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- Is there any role for the off-patent period in the model?
  - I believe there is, and it may affect competition at the patent stage.
- Joint analysis of the key times of the model.
  - Role for unobserved heterogeneity??
- A reference: Ganuza et al (2009) "A world of small innovations"
  - Low demand elasticity reduces incentives to innovate
  - Regulation reduces rents but may increase demand elasticity.