



NAEC Innovation Lab Workshop  
New Perspectives on the labour market: Policy applications using ABM  
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WORKSIM

AN ABM MODEL TO STUDY LABOUR MARKETS

Discussion

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# Literature on labour market segmentation assumes agents are fully rational

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- Requires optimisation algorithms to solve the agents decision problem;
- Some simplifications imposed to find an analytical solution;
- Numerical methods allow for increasingly complex models;
- Recent work:
  - Kettemann, Kramarz and Zweimüller (2017); Fialho (2017); Guglielminotti and Nur (2016); Cahuc, Charlot and Malherbert (2016); Bertron and Garibaldi (2012); Tealdi (2012); Caggese and Cuñat (2008).



# Relying on bounded rationality, *WorkSim* can accommodate a very complex environment

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## ➤ Individuals

- Heterogeneous workers. Interactions within households;
- Multiple states: inactive, unemployed, employed without searching or searching on-the-job while employed.
- Different types of human capital changing over time (general, occupational and job-specific);

## ➤ Firms

- Firms with multiple jobs face idiosyncratic demand shocks. Multiple occupations. Jobs with different characteristics (hours worked, amenities, etc.) and requirements of human capital;
- Incomplete information about workers' productivity and potential for screening;

## ➤ Detailed institutions and features of the labour law



## With a more realistic environment, *WorkSim* opens up new possibilities for policy analysis

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- With multiple jobs, fixed-term contracts can function as buffer when firms face uncertain future demand;
- Model can generate a mix of contract types – changing over time - within the same firm;
- It can also generate a distribution of fixed-term contract durations. Can analyse contracts of very short duration;
- Generates flows between multiple states, endogenous share of fixed-term contracts in new hires and total employment.



# Additional complexity also raises questions

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- **Identifying essential parameters.** What parameters are crucial? Are there parameters with little role?
- **Ensuring robustness**
  - How sensitive are the simulation results to each parameter?
  - How sensitive are the results to the chosen distributions and stochastic processes when initialising the simulation?
- **Focused narrative.** Are there mechanisms more important than others?
- **Incorporating potentially missing (and relevant) effects**
  - For e.g. firm choosing contract type depending on worker productivity?  
Complementarity between worker and firm? Wage differential across contracts?  
Differences in training?



# Bridging divides between potentially complementary approaches

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## ➤ ABMs of the labour market:

- More realistic;
- Analyse detailed features of institutions and labour law;
- Investigate several outcomes simultaneously.

## ➤ Analytical models of the labour market:

- Disentangle between two or a few mechanisms;
- Enhance understanding of one precise channel;
- Provide a narrative for one observed phenomenon.

