



# UNIVERSITÀ DI PISA

## INDUSTRY AND INNOVATION DYNAMICS

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### FEDERICO TAMAGNI

Anno accademico 2023/24  
CdS ECONOMICS  
Codice 665PP  
CFU 6

Moduli	Settore/i	Tipo	Ore	Docente/i
INDUSTRY AND INNOVATION DYNAMICS	SECS-P/02	LEZIONI	42	ARIANNA MARTINELLI FEDERICO TAMAGNI

#### Obiettivi di apprendimento

##### *Conoscenze*

This course introduces to theory and empirics of firm dynamics and to its interplay with innovation patterns in shaping market selection and sectoral patterns of growth and productivity. The lectures have a strong applied focus, providing students with solid knowledge of the empirical evidence concerning key firm-level characteristics (size, growth, productivity and innovation) and industry-level dynamics, with the final aim to develop an informed view about the ability of theories to match with stylised facts.

##### *Modalità di verifica delle conoscenze*

Interaction in class via Q&A sessions (and work-groups if number of participants allows), in addition to a standard final oral exam on the course content.

##### *Capacità*

- Develop ability to critically read scientific articles and draw implications for interpreting the real world
- Knowledge of specific empirical skills about: (a) understanding data useful for measuring firm and industry level performance; (b) econometric/statistical techniques specific to the area of research

##### *Modalità di verifica delle capacità*

Interaction in class via Q&A sessions (and work-groups if number of participants allows), in addition to a standard oral final exam

##### *Comportamenti*

Developing ability to critically connect theories and empirical facts

##### *Modalità di verifica dei comportamenti*

Interaction in class via Q&A sessions (and work-groups if number of participants allows), in addition to a standard oral final exam

##### *Prerequisiti (conoscenze iniziali)*

Basic knowledge of microeconomics, production theory and econometrics at bachelor level

##### *Programma (contenuti dell'insegnamento)*

Course outline:

1. The dynamics of firm productivity: empirics and stylised facts
2. Firm size and firm growth: empirics and stylised facts
3. The role of entry, exit and firm age in industry dynamics
4. Firm heterogeneity and firm-industry dynamics: review of alternative theories
5. Market selection and industrial dynamics: empirics of market selection
6. Measuring innovative activity of firms
7. Sectoral patterns of innovation
8. Innovation and firm-growth



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### Bibliografia e materiale didattico

Lecture Notes/Slides and a list of scientific articles/book chapters provided in class.  
Mandatory readings are listed here below.

#### 1) On Firm-industry dynamics (productivity, size-growth, entry/exit, theories and empirics of selection):

- Bartelsman, E.J., and M. Doms (2000), "Understanding Productivity: Lessons from Longitudinal Microdata", *Journal of Economic Literature*, 38, 569-594.
- Levinsohn, J., and A. Petrin (2003), "Estimating Production Functions Using Inputs to Control for Unobservables", *Review of Economic Studies*, 70, 317-41.
- Bottazzi, G., and A. Secchi (2003), "Common Properties and Sectoral Specificities in the Dynamics of U.S. Manufacturing Companies", *Review of Industrial Organization*, 23, 217-232.
- Bottazzi, G., A. Secchi and F. Tamagni (2014), "Financial constraints and firm dynamics", *Small Business Economics*, 42, 99-116.
- Sutton, J. (1997), "Gibrat's Legacy", *Journal of Economic Literature*, 35, 40-59.
- Bartelsman, E.J., S. Scarpetta and F. Schivardi (2005), "Comparative Analysis of Firm Demographics and Survival: Micro-Level Evidence for the OECD Countries", *Industrial and Corporate Change*, 14, 365-391.
- Dunne, T., M.J. Roberts and L. Samuelson (1988), "Patterns of Firm Entry and Exit in US Manufacturing Industries", *Rand Journal of Economics*, 19, 495-515.
- Haltiwanger, J., R.S. Jarmin, and J. Mirand (2013), "Who Creates Jobs? Small versus Large versus Young", *The Review of Economics and Statistics*, 95, 347-361.
- Castellacci, F. (2011), "Theoretical Models of Heterogeneity, Growth and Competitiveness: Insights from the Mainstream and Evolutionary Economics Paradigms", in Miroslav N. Jovanovi (ed.), *International Handbook on the Economics of Integration*, Volume II, chapter 5, Edward Elgar Publishing.
- Dosi, G., O. Marsili, L. Orsenigo and R. Salvatore (1995), "Learning, market selection and the evolution of industrial structures", *Small Business Economics*, 7, 411-436.
- Hopenhayn, H. (1992), "Entry, Exit, and Firm Dynamics in Long Run Equilibrium", *Econometrica*, 60(5), 1127-1150.
- Malerba, F. (2007), "Innovation and the dynamics and evolution of industries: Progress and challenges", *International Journal of Industrial Organization*, 25(4), 675-699.
- Dosi, G., D. Moschella, E. Pugliese and F. Tamagni (2015), "Productivity, market selection and corporate growth: comparative evidence across US and Europe", *Small Business Economics*, 45, 643-672.
- Foster, L., J.C. Haltiwanger and C.J. Krizan (2001), "Aggregate Productivity Growth: Lessons from Microeconomic Evidence", in *New Developments in Productivity Analysis*, National Bureau of Economic Research, Inc, NBER Chapters, 303-372.

#### 2) On innovation and firm-industry dynamics:

- Greenhalgh, C. and M. Rogers (2010), "Innovation, Intellectual Property and Economic Growth, Princeton University Press" - Chapters 1, 2, 3 and 5.
- Pavitt, K (2006), "Innovation Processes", ch.4 in J. Fagerberg, D.C. Mowery, and R.R. Nelson (eds.) *The Oxford Handbook of Innovation*, Oxford: Oxford University Press
- Hall, B. H. and R. Ziedonis, (2001), "The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995", *The RAND Journal of Economics*, 32(1), 101-128.
- Smith, K. (2006) "Measuring Innovation", ch. 6 in J. Fagerberg, D.C. Mowery, and R. R. Nelson (eds.) *The Oxford Handbook of Innovation*, Oxford: Oxford University Press
- Greenhalgh, Ch and M. Rogers (2006), "The value of innovation: The interaction of competition, R&D and IP", *Research Policy*, 35(4), 562-580
- Breschi, S., F. Malerba and L. Orsenigo (2000), "Technological regimes and Schumpeterian patterns of innovation", *Economic Journal* 110(April), 388-410.
- Budish, E., Roin, B. N., and H. Williams. (2016), "Patents and Research Investments: Assessing the Empirical Evidence", *American Economic Review*, 106 (5):183-87.
- Srholec, M. and B. Verspagen (2012), "The Voyage of the Beagle into innovation: explorations on heterogeneity, selection, and sectors", *Industrial and Corporate Change*, 21(5), 1221-1253

#### 3) On innovation and firm growth:

- Audretsch, D.B., A. Coad, and A. Segarra (2014), "Firm growth and innovation", *Small Business Economics*, 43, 743-749.
- Bianchini, S., G. Pellegrino and F. Tamagni (2018), "Innovation complementarities and firm growth", *Industrial and Corporate Change*, 27, 657-676.
- Crepon, B., E. Duguet and J. Mairesse (1998), "Research, Innovation And Productivity: An Econometric Analysis At The Firm Level", *Economics of Innovation and New Technology*, 7, 115-158.



## Modalità d'esame

A final oral examination.

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