

LUCA EDUARDO FIERRO

luca.eduardo.fierro@gmail.com

Office Contact Information

Università Politecnica delle Marche
Piazzale Martelli Raffaele, 8,
Ancona 60121, Italy

Research Field

Macroeconomics, Agent-Based Modelling, Learning, Evolutionary Technological Change, Automation

Current Position

PostDoc Research Fellow, Università Politecnica delle Marche, 2019 to present

Doctoral Studies

Ph.D., Economics, Università Politecnica delle Marche, 2020
Dissertation: “*Three Essays in Agent Based Macroeconomics*”
Supervisors: Prof. Alberto Russo and Dr. Alessandro Caiani

Postgraduate Studies

M.A., Political Economy, Kingston University, with distinction, 2016
Dissertation: “*Modelling the Missing Macro Link*”
Supervisor: Dr. Devrim Yilmaz

M.Sc., Economics, University of Bologna, 2017
Dissertation: “*Private Debt and Crises: a SVAR approach to the Minsky’s Financial Instability Hypothesis*”
Supervisor: Prof. Roberto Golinelli

Undergraduate studies

B.Sc. Economics, University of Bologna, 2012

Summer Schools

The Oxford Summer School in Economic Networks, University of Oxford, 2017
Applied SFC and Agent-Based Macro Modelling Summer School, University Paris XIII, 2017
6th FMM International Summer School, 2017

Visiting Positions

Visiting Ph.D. student, University of Oxford, 2018

Scholarships

Ph.D. Scholarship, Università Politecnica delle Marche, 2016-2019
Ph.D. Scholarship, Università di Genova (Rejected), 2016
Ph.D. fee waiver, New School for Social Research (Rejected), 2016
ER.GO Scholarship for Master Degree Abroad, 2015

Talks at Conferences

WEHIA19, City University of London, 2019
New Analytical Tools and Techniques for Economic Policy Making, OECD, 2019
30th Annual EAEPEE Conference, Nice Sophia Antipolis University, 2018

Teaching Experience

Agent-Based Modelling (PhD), Università Politecnica delle Marche, 2020

Macroeconomics (undergraduate), Università Politecnica delle Marche, 2017-2018, TA

Macroeconomics (undergraduate), Kingston University, 2016, TA

Macroeconomics (undergraduate), University of Bologna, 2013, TA

Research Experience

Research Assistant to Prof. Engelbert Stockhammer, Kingston University.

INET funded project: *“Income Distribution, Asset Prices, and Aggregate Demand Formation, 1850-2010. A Post-Keynesian Approach to Historical Macroeconomic Data”*, 2016

Programming and Softwares Skills

JAVA (good command), R (good command), Wolfram Mathematica (intermediate), Octave (basic), Dynare (basic), LATEX (good command).

Working Papers

“Automation, Job Polarization and Structural Change in an ABM framework”, (with A. Caiani and A. Russo). **Wp available soon**, do get in touch if interested!

As any technological revolution, modern automation is likely to have profound and uneven effects on the labor market. One of such effects, is how the demand for different types of jobs will change in response to it. To investigate this point, most of the current research has focused on the *direct effects*, that is on how the employment shares of different skills evolves in industries experiencing high rates of automation. Much less has been said about the so called *general equilibrium effects*, that is the net results occurring once economic adjustments have taken place beyond the initial shock.

This paper tries to fill the gap and in order to do so, we designed an Agent-Based Macroeconomic model able to accomodate for workers heterogeneity, endogenous technical innovations, and structural change. Following the available empirical literature on direct effects, we model automation as a cumulative, productivity enhancing and skill-biased technological progress, showing that - albeit counterintuitive - the net effect on the labor market can be job polarisation, that is a dynamics in which jobs located at the two poles of the skill distribution tends to grow reducing the employment shares of middle-skilled jobs. Also, consistently with empirical observation, we will show that despite the relative growth in low-skilled jobs, low-skilled wages can decrease relative to both high and middle-skilled wages.

We will see that at the root of our results there is a complex, yet reasonable and empirically consistent, interplay between structural change and households heterogeneity in skills and preferences. Moreover, we will exploit our framework to perform R&D enhancing policies, showing that in a world of skill biased technological progress, policies aimed at sustaining low-wages can boost productivity as well as reducing wage inequality.

Works in Progress

“Addressing the Lucas’ Critique in ABMs: the Expectations Formation Problem”

In this paper I will tackle the Lucas’ critique for a specific class of macroeconomic models, known as Agent Based Models (ABMs hereafter). In particular, I will study if in ABMs it is possible to achieve collective rationality, i.e. aggregate unbiased expectations, despite the impossibility of using rational expectations à la Muth. In order to do so, I will experiment various expectation formation mechanisms coupled with social learning. Results suggest that, under certain conditions, it is possible to achieve unbiased expectations at the aggregate level and that a simple genetic algorithm can sensibly improve agents’ forecasting performances. Moreover, I impose several policy shocks in order to study whether and in which conditions agents adjust to changes in the environment. I found that in general, policies can have an immediate destabilising effect, reflected by a spike in the aggregate forecasting error, however the shock is quickly absorbed as the aggregate expectation error quickly recover toward zero. This is particularly true when agents learn using the genetic algorithm, suggesting that flexible rules allow agents to cope better with policy shocks and therefore to be somehow *more* immune to the Lucas’ critique.

Such result is a step forward in the search for a benchmark expectational rule in the ABM literature, moreover it represents a major departure with respect to the existing literature on the subject.

“Are Robots Skill-Biased? An Empirical Investigation for European Countries”, (with S. Leoni, M. Gallegati, and E. Valentini)