

Schumpeter Meeting Keynes Meeting Weber: Technical Change, Institutions, and Policies as Drivers of Economic Dynamics

Giovanni Dosi¹

Email: gdosi@sssup.it

¹Scuola Superiore Sant'Anna, Pisa (Italy)



The Great Recession and Macroeconomic Theory

- ▶ **The Economic Crisis is a Crisis for Economic Theory?**
 - ▶ **YES!**, Kirman (2010); Colander et al. (2009); Caballero (2010); Stiglitz (2011); Kay (2011); Dosi (2011); Delong (2011); Krugman (2011)
- ▶ **Lessons from the financial crisis and the Great Recession (Stiglitz, 2011 2017), and earlier history!**
 - ▶ distributions (including income distributions) matter
 - ▶ mechanism of demand formation matter
 - ▶ credit and asymmetric information problems among heterogeneous agents
 - ▶ markets that do not clear
 - ▶ deep departures from rational expectations and perfect rationality
 - ▶ financial system and interconnectedness matter
 - ▶ involuntary unemployment is ubiquitous phenomenon
 - ▶ institutions and policies matter

A Promising Way to Tackle Such Evidence: Agent-Based Evolutionary Models

Trichet (18/11/2010): *“The atomistic, optimising agents underlying existing models do not capture behaviour during a crisis period. We need to deal better with heterogeneity across agents and the interaction among those heterogeneous agents. Agent-based modelling dispenses with the optimisation assumption and allows for more complex interactions between agents.”*

- ▶ ABMs allow for all the above ingredients, because they model economies as complex dynamical systems of **heterogeneous** and **boundedly rational** agents, interacting **out of equilibrium**, and nested in a thread of **institutions**
- ▶ ABMs possible alternative to DSGE to provide microfounded macroeconomic models accounting for fluctuations and economic crises

An Example of the Theoretical Divide: Wage Determination and Macroeconomic Dynamics

- ▶ Long debate in macroeconomics about the role of wages in the determination of the level of unemployment
- ▶ Neoclassical (including DSGE) models: real wage rigidity and frictions are the main sources of unemployment in labor markets
- ▶ Keynes' view: aggregate demand deficiency is the main source of unemployment

A Keynesian Answer to unemployment, well suited for ABMs

Coordination failures, Cooper and John (1988, pp.442–443)

Strategic complementarities are associated with the presence of 'Keynesian features' such as multiple equilibria and a multiplier process [. . .]. When this occurs a *coordination failure* is present: mutual gain from an all-around change in strategies may not be realised because no individual player has an incentive to deviate from an initial equilibrium.

Stiglitz (2013)

The problem that Keynes recognized was that wages can be too *flexible*. Indeed, when wages fall, people's income falls and their ability to demand goods falls as well. Lack of aggregate demand was the problem with the Great Depression, just as lack of aggregate demand is the problem today. Imposing more wage flexibility can result in exacerbating the underlying problem of lack of aggregate demand.

Our Goals (part I)

- ▶ Consider the Keynes+Schumpeter agent-based model family of agent-based models (Dosi et al. JEDC 2010, 2013, 2015, 2017, SER 2017)
- ▶ Which micro and macro empirical regularities can the K+S model explain?
- ▶ Which issues can be explored with the K+S model?
 - ▶ how different income distribution regimes affect macroeconomic performance
 - ▶ the role of financial factors in economic crises
 - ▶ the role of different institutions governing the labor market

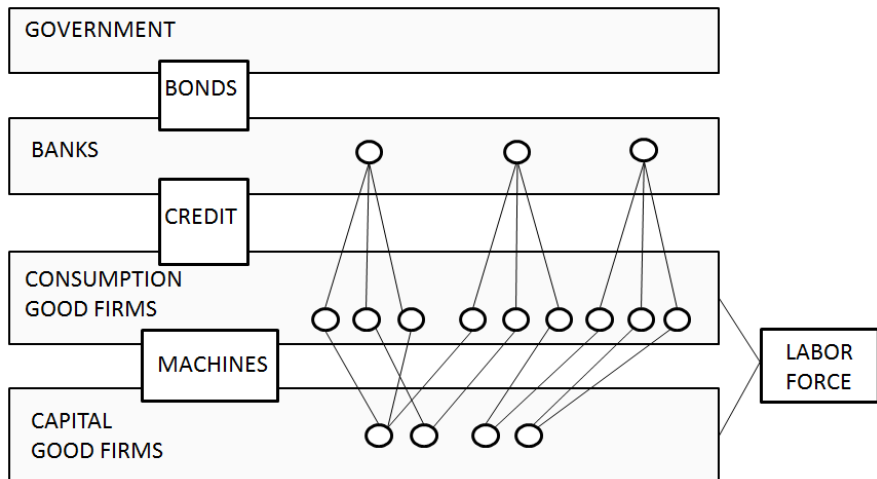
Our Goals (part II)

- ▶ What type of policies experiments can be studied with the K+S model? Do the effects of policies spill over at various frequencies?
 - ▶ Schumpeterian innovation policies
 - ▶ industrial policies
 - ▶ fiscal and monetary policies
 - ▶ labor market policies
- ▶ How do policies perform in different scenarios?
 - ▶ income distribution
 - ▶ firm investment behaviours
 - ▶ wage formation mechanisms

Related Papers

- ▶ Dosi, G., Fagiolo, G. and Roventini, A. (2010), “Schumpeter Meeting Keynes: A Policy-Friendly Model of Endogenous Growth and Business Cycles”, *Journal of Economic Dynamics and Control*, 34: 1748-1767
- ▶ Dosi, G., Fagiolo, G., Napoletano, M. and Roventini, A. (2013), “Income Distribution, Credit and Fiscal Policies in an Agent-Based Keynesian Model”, *Journal of Economic Dynamics and Control*, 37: 1598-1625
- ▶ Dosi, G., Fagiolo, G., Napoletano, M., Roventini, A. and Treibich, T. (2015), “Fiscal and Monetary Policies in Complex Evolving Economies”, *Journal of Economic Dynamics and Control*, 52: 166-189
- ▶ Dosi, G., Pereira, M., Roventini, A. and Virgillito, M. (2017), “When more Flexibility Yields more Fragility: the Microfoundations of Keynesian Aggregate Unemployment”, *Journal of Economic Dynamics and Control*, 81: 162-186
- ▶ Dosi, G., Pereira, M., Roventini, A. and Virgillito, M. (2017), “The effects of labour market reforms upon unemployment and income inequalities: an agent-based model”, *Socio-Economic Review*, forthcoming

K+S Model Structure



Stylized Facts Replicated by the K+S model

Firm level SF

Skewed firm size distribution
Fat-tailed firm growth rate distribution
Productivity heterogeneity across firms
Persistent productivity differentials among firms
Lumpy investment rates at firm-level

Aggregate level SF

Endogenous self-sustained growth with fluctuations and crises
Fat-tailed GDP growth rate distribution
Relative volatility of GDP, C, I
Cross-correlation of macro variables
Pro-cyclical aggregate R&D investment
Persistent unemployment
Boom-and-Bust credit cycles
Wage, Beveridge, and Okun curve
Unemployment and inequality correlation

The K+S model as a Laboratory for Policy and Institutional Experiments

- ▶ **Four major experiments:**
 - ▶ the effects of fiscal and austerity policies
 - ▶ the impact of different institutional regimes of the labor market
 - ▶ the role of innovation and mission-oriented policies

- ▶ **The impact of different policies and institutional regimes is studied both on short- and long-run economic dynamics**

The Short- and Long-Run Damages of Austerity Policies

Dosi, Fagiolo, Napoletano, Roventini, Treibich (2015), JEDC

- ▶ Fiscal rules increase GDP volatility, unemployment, and the likelihood of economic crises
- ▶ Austerity policies considerably reduce the long-run performance of the economy
- ▶ Austerity is self-defeating and may lead to sovereign debt crises

Comparing “Fordist” and “Competitive” Regimes of the Labor Market

	Fordist	Competitive
Wage sensitivity to unemployment	low (rigid)	high (flexible)
Workers search activity	unemployed only	unemployed and employed
Labour firing restrictions	under losses only	none
Workers hiring priority	higher skills	lower payback
Workers firing priority	lower skills	higher payback
Unemployment benefits	yes	yes (reduced)
Minimum wage productivity indexation	full	partial

Labor-Market Structural Reforms and Unemployment

Dosi, Pereira, Roventini, Virgillito (2017), JEDC and SER

- ▶ Too flexible wage-labour nexus can be detrimental for aggregate economic dynamics
- ▶ The Fordist regimes outperforms the Competitive one
- ▶ Institutions such as minimum wage and unemployment benefits substantially improves both the short- and long-run performance of the economy
- ▶ High labor market flexibility hamper growth and lead to the emergence of hysteresis in unemployment, productivity and GDP series

Innovation and Industrial Policies

- ▶ Incentive-oriented, horizontal policies
- ▶ Mission-oriented policies

Mission oriented vs. diffusion oriented at the OECD late 70s/early 80s:

- ▶ H. Hergas vs. F. Chesnais, C. Freeman, R. Nelson, G. Dosi , L. Soete...
- ▶ But then came the illiterate conclusions of M. Thatcher and R. Reagan: game over ...
- ▶ ... Together with the apparently unstoppable spreading of the “Washington consensus”

Why not Setting a REAL Mission-Oriented Objective?

“We want to achieve objective X, whatever it takes”

But then, we need:

- ▶ much less reliance on incentives alone
- ▶ more command-and-control
- ▶ reliance on public procurement
- ▶ much more public research
- ▶ possibility of public intervention all the way to production

How to Model Mission-Oriented Policies?

See the next presentation!