

Introducing the Econ-ARK: Economics “Algorithmic Repository and toolKit”

Short Version

July 27, 2018

Goals: Like DYNARE's, but for Models With Heterogeneity

State-of-the-art tools for:

- ① Solving microeconomic dynamic stochastic optimization problems
 - 'Hard' Bellman problems with uncertainty, 'kinks,' nonconvexities
- ② Simulating populations of agents
 - Whether or not they are solving DSOP
 - Allows disciplined exploration of deviations from RE
- ③ Finding equilibria for markets/economies populated by such agents

Who Has Produced It?

Name	TLA	Affiliation
<i>Christopher D Carroll</i>	CDC	JHU, CFPB
<i>David C Low</i>	DCL	CFPB
<i>Nathan M Palmer</i>	NMP	OFR
<i>Matthew N White</i>	MNW	UDel, CFPB
<i>Alex Kaufman</i>	ABK	CFPB → Princeton

Nothing herein may be interpreted as reflecting opinions of

- CFPB - United States Consumer Financial Protection Bureau
- JHU - Johns Hopkins University
- IMF - International Monetary Fund
- OFR - Office of Financial Research, U.S. Treasury
- UDel - University of Delaware

Big Grant from Alfred P. Sloan Foundation!

Three Years

- Hire Programmers, RA's, Open Source Project Managers, etc etc

What Is It Good For?

- Heterogeneous Agent Macro Models
 - Original name: **H**eterogeneous **A**gent **R**esources and tool**K**it
 - HARK!
- Structural Micro Models (e.g., labor, health)
- IO models with equilibrium between consumer agents and firm agents

Why: Goals

Make it *much* easier:

- To get started doing structural Heterogeneous Agent modeling
- To teach newcomers how to use such models
- To *compare* models to each other
- To add new capabilities
- To mix-and-match components/modules/agent types

Remove the excuse 'Structural model was not worth the effort'

Where Is It?

Browse without installing:

- Browse on our webpage at econ-ark.org
- Browse our code at <http://github.com/econ-ark>
- Browse our talks at <http://github.com/econ-ark/PARK>
- Overview paper at <http://github.com/econ-ark/PARK/SciPy2018.pdf>
- Browse our live [notebooks](#)
- Browse our [documentation](#)

Installing It On Your Local Computer

- You Need Python 2.7 (Python 3 target is July)
- If you don't have Python 2.7 on your computer, install either:
 - 1 **Anaconda2** - adds many packages useful for scientific computing
 - 2 Python 2.7
 - On Mac or Linux to download and install it
 - On Windows
 - Install Jupyter
 - Make sure you have **pip** installed
 - 3 Install the 'econ-ark' package:
 - `pip install econ-ark`
- Get our **our demonstration notebooks** from **DemARK**

References I

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