Introducing the Econ-ARK: Economics "Algorithmic Repository and toolKit"

Minicourse by Chris Carroll and Matt White at
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Goal: Tool like DYNARE for Models With Heterogeneity

State-of-the-art set of tools for:

1. Solving dynamic stochastic optimization problems
   - 'Hard' Bellman problems with uncertainty, 'kinks,' nonconvexities
2. Simulate behavior of populations of agents
3. Finding equilibria for markets/economies populated by such agents

Who Has Produced It?

Name	TLA	Affiliation
Christopher D Carroll	CDC	JHU, CFPB
David C Low	DCL	CFPB
Nathan M Palmer	NMP	OFR
Matthew N White	MNW	UDel, CFPB
Alex Kaufman	ABK	CFPB $\rightarrow$ Princeton

Nothing herein may be interpreted as reflecing 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

Just Received 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 equilibrim between consumer agents and firm agents

Why: Goals

Make it *much* easier:

- To get started doing structural Heterogeneous Agent modeling
- To teach (with hands-on, problem-set-assignable exercises)
- 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'

How: Github+Python=Gutenberg

Suite of powerful modern tools developed by software engineers:

- Almost-Automatic Integrated Documentation
- Robust Built-In Testing
- Continuous Integration
- Version Control
- Object-Oriented Programming (Python!)
- Integrated Development Environments
- Apache License
- ...

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

Install 'econ-ark' on your computer:

- If you don't have Python 2.7 on your computer, get either:
  - Python 2.7 only
    - On Mac or Linux to download and install it
    - On Windows
  - Anaconda which adds many packages useful for scientific computing
- Make sure you have `pip` installed
- Install the 'econ-ark' package:
  - `pip install econ-ark`

Run notebooks on your own computer:

- Install Jupyter

Run our demonstration notebooks using MyBinder

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