

### **B(c). The Real Business Cycle (New Classical) paradigm**

The RBC model emphasizes supply disturbances in a frictionless world with representative agents, complete asset markets, perfectly rational individuals and flexible prices.

I. How did it come into existence?

A. Two empirical findings concerning monetary policy and economic shocks implied a dominant role for the supply side of the economy and led to the RBC model

a) Most macroeconomic series seem to follow a random walk (Nelson and Plosser, 1981)  $\Rightarrow$  Changes in macroeconomic activity are mostly permanent (business cycles have a large permanent component)  $\Rightarrow$  AD cannot (?) induce permanent changes in quantities  $\Rightarrow$  AS shocks must be behind macroeconomic fluctuations

$$x(t) = x(t-1) + u(t) \quad \dots = u(t) + u(t-1) + u(t-2) + \dots$$

Random walk: Stochastic trend, shocks have permanent effects

b) Money did not seem to matter for economic activity in VARs (Sims):

But what is the instrument of monetary policy?

B. Disatisfaction with the flexible price RE model (Lucas). The informational lags it requires are not plausible

II. An important **methodological** development: Calibration and simulation of stochastic GE models.

1. Construct an artificial economy (a model)
2. Derive the first order conditions
3. Postulate values for the parameters of the model and the distribution of the shocks (calibration)
4. Solve the model numerically as a function of the state variables and the shocks
5. Simulate: Feed in random values for the shocks (according to their distribution) in the derived solutions and generate time series for the variables of interest (output, investment, consumption, inflation...)
6. Calculate various moments of the joint probability distribution of these artificially generated time series (variances, covariances, autocorrelation..)
7. Calculate the same moments using actual data (stylized facts)
8. Model evaluation: Compare the two sets of moments

III. Main problems:

- a) Selection of parameter values (calibration)
- b) Supply shocks are unobservable. How large are they in reality?

The Solow-Prezcott residual: Supply shocks = Multifactor productivity

$$Y = AK^a L^{1-a}$$

Labor hoarding

- c) Is the supply of labor sufficient elastic?
- d) Are prices countercyclical?
- e) Lack of dynamics (propagation mechanism)
- f) Lack of formal statistical validation of theories

#### **IV. Other properties**

Irrelevance of money for real economic activity (neutrality)

Optimality of business cycles (voluntary unemployment, creative destruction)

**V. Empirical performance:** How well does the standard RBC model explain the behavior of actual economies?

Some success

The biggest problems are found in accounting for labor market behavior (e.g. for the lack of correlation between the real wage and employment)

Extensions: Labor supply shifts

Indivisible labor

Fiscal policy       $u(c,g) \quad g \uparrow \quad T \uparrow \quad c \downarrow \quad \text{leisure} \downarrow \quad \text{work} \uparrow$

Household production

Human capital

## B. Unemployment

Worker-job mismatch. Job creation and destruction.

### **B(d). New Keynesian theory**

Heterogeneity Complementarity of interactions (strategic, macroeconomic)

Example: Prisoner's dilemma

	C	NC
C	(-1,-1)	(0,-3)
NC	(-3,0)	(2,2)

Positively sloped reaction functions

Coordination failure  $\Rightarrow$  Multiple equilibria  $\Rightarrow$  Opens up the way for government intervention to select the most favorable equilibrium (recurrent theme in Keynesian economics: market failures, the government serves the public interest)

### *Coordination games*

a) Production complementarities (increasing returns to scale)

If an agent works or produces more the remaining agents become more productive

$$u(c) - v(e)$$

$$c = f(e, E)$$

b) Search

Trade: The larger the fraction of agents searching the easier it is to find a partner

(increasing returns to scale)

c) Imperfect competition

Multiple, oligopolistic sectors (each producing a homogeneous good)

Strategic substitutability within sectors

Strategic complementarity across sectors

*D. Are aggregate shocks important?*

Are business cycles due to aggregate shocks. Empirical evidence on the source of

aggregate fluctuations: Aggregate vs “idiosyncratic shocks.