# A BRIEF HISTORY OF MACROECONOMICS

## MARCH 26, 2012



## THE PHASES OF MACROECONOMICS

- **Three seminal phases of the history of macroeconomic thought/ practice**
  - **Phase I: Measuring macroeconomic activity (1930's – 1950)**
  - **Phase II: Keynesian-inspired macroeconometric models (1950 – 1970's)**
  - **Phase III: Dynamic General Equilibrium (DGE) methodology (1980's – today)**

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  - Phase III: Dynamic General Equilibrium (DGE) methodology (1980's – today)
  - Phase IV?

    What changes are forthcoming in the profession (policy-making and theory) spurred by current financial and economic downturn?

    Focus on linkages between financial markets and the macroeconomy

    Who knows…





## THE BIRTH OF MACROECONOMICS

- "Macroeconomics" born as a field during and because of the Great Depression
  - Idea that government could/should regulate the periodic ups and downs of the economy rose to prominence
- John Maynard Keynes, *The General Theory of Employment, Interest, and Money* (1936)
  - Basic tenet: various "rigidities" in many markets lead to "disequilibria" that can last a long time

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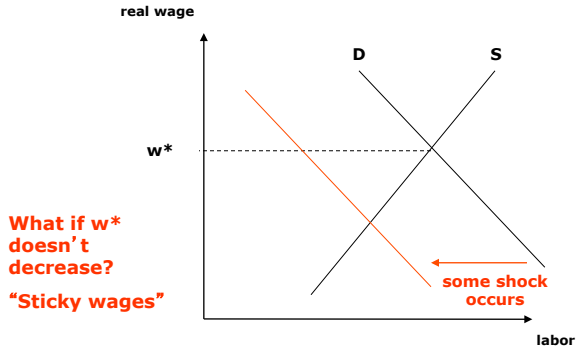






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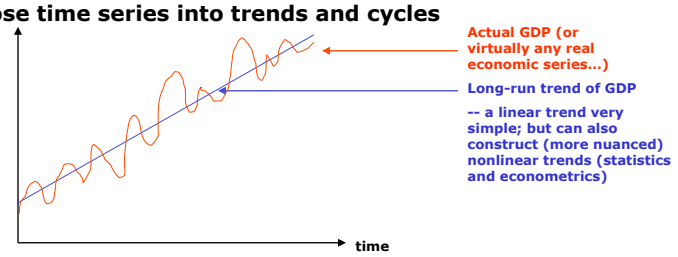
- Burns and Mitchell, *Measuring Business Cycles* (1946)
  - First systematic accounting of the co-movement of various aggregates
    - i.e., GDP, consumption, employment, inflation, unemployment rate, etc…

## LONG-RUN GROWTH VS. BUSINESS CYCLES

- Decompose time series into trends and cycles




- Two clear patterns
  - Long-run growth
  - Frequent and sometimes big short-run fluctuations around long-run trend
- Are the short-run fluctuations tightly related to the long-run trend?
  - Conventional view in economics has been "no"



Macro Fundamentals

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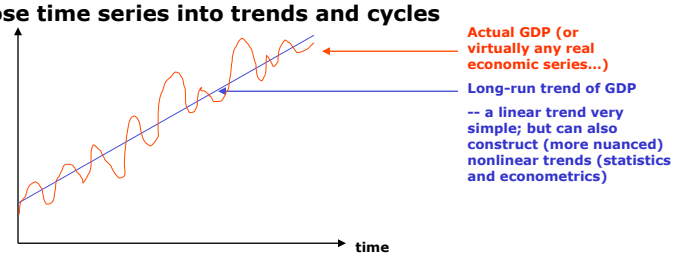


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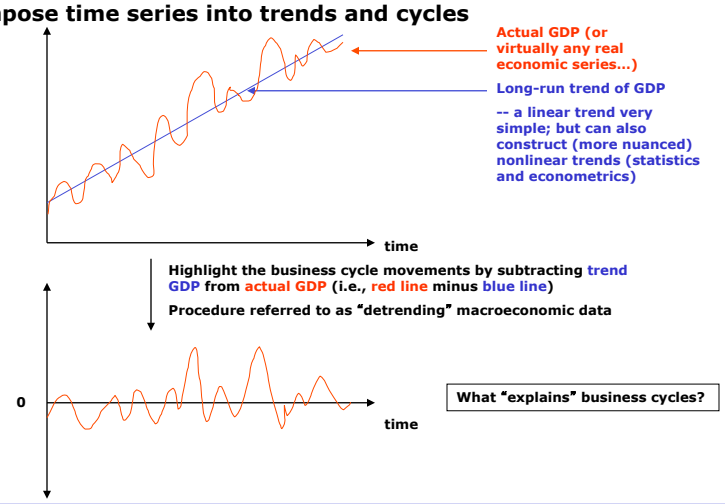
- Are the short-run fluctuations tightly related to the long-run trend?
  - Conventional view in economics has been "no"
- Under the "no" view, a separation of fields
  - Studying the trend ("economic growth" and "development")
  - Studying the fluctuations ("macroeconomics")

# BUSINESS CYCLES

- Decompose time series into trends and cycles








# PRINCIPLES OF KEYNESIAN MACROECONOMICS

- Basic Tenet: price rigidities/inflexibilities characterize many goods markets and factor markets
  - "Sticky prices"
- (Many) other rigidities/inflexibilities affect markets' functioning as well…
- …but price (and wage) rigidities the central tenet
  - More general discussion in Akerlof (2007) essay
- Which types of shocks are the main driver of business cycles?
  - Policy shocks – both monetary policy and fiscal policy
- A basis for policy activism: because of high elasticity of private-sector demand to macroeconomic policy, when/if other (i.e., non-policy) types of shocks affect the economy, monetary and fiscal policy can and should step in to mitigate "recessions/depressions"

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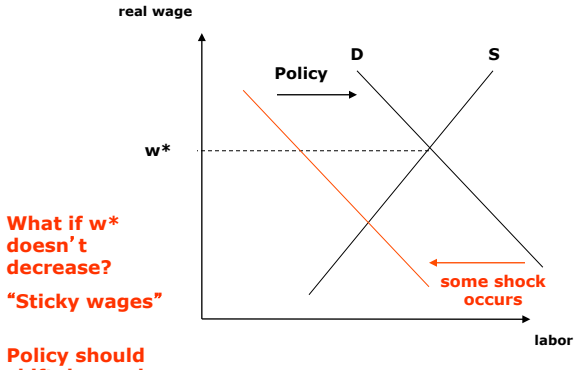


What if w* doesn't decrease?

"Sticky wages"

Policy should shift demand back out





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- **Keynes' *General Theory* just a verbal description of things…**

# THE RISE OF MACROECONOMICS

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- How to "model" (i.e., conceptually/rigorously/mathematically think about) business cycles?
  - Phase II: The big macroeconometric models





# THE GLORY DAYS OF MACROECONOMICS

- Big "Keynesian macroeconometric" models prominent by the 1960's, led by
  - Kennedy's Council of Economic Advisers (Solow, Tobin, Samuelson)
  - MIT/Penn/Federal Reserve Board
  - ISLM and AS/AD model (Hicks, 1937) the conceptual core

General idea of Keynesian-inspired macroeconometric models

$$x_{1t} = \alpha_0 x_{2t} + \alpha_1 x_{3t} + \alpha_2 x_{3t} + \ldots.$$
$$x_{2t} = \alpha_3 x_{1t} + \alpha_4 x_{3t} + \alpha_5 x_{4t} + \ldots$$
$$\text{M}$$
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Dozens or hundreds of variables and equations, some of which describe how policy affects the economy

Say $x_3$ and $x_{13}$ are policy variables

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It's all about estimating the alpha terms...

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- Statistical relationships between various macro variables
- Basic approach: estimate (econometrically) these equations and use them for policy advice
  - In particular: estimate all the alpha coefficients using historical data and posit that this is ***how*** the macroeconomy "works"



The Evolution of Macroeconomics: Phase II

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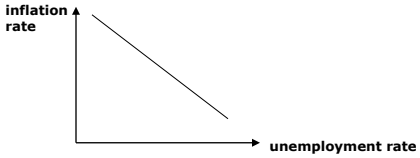
- An approach to macroeconomic policy-making embodied most succinctly in the view and supposed promise of the Phillips Curve

## THE PHILLIPS CURVE

- A seemingly stable, predictable relationship between an economy's inflation rate and unemployment rate





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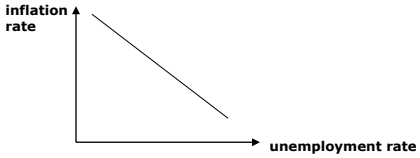


- Came to be the centerpiece of the Keynesian macroeconometric agenda
- Came to be the centerpiece for policy advice…
  - …for fiscal policy (given forceful voice during the Kennedy administration – CEA populated with future Nobel Laureates Robert Solow, James Tobin, Paul Samuelson…John Kenneth Galbraith a more muted enthusiast of this approach to policy formulation)
  - …and eventually for monetary policy (rise of an activist Fed: raising/ lowering interest rates to "fine tune" macroeconomic performance

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- Became widely used for policy-making…
- …until they "stopped working" in the 1970's
  - Amidst a high-inflation environment (U.S. inflation between 15-20% in second half of 1970's), sparked by OPEC oil embargoes
- Lucas Critique (1976)

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- **Lucas Critique (1976): The alpha's themselves should be thought of / modeled as *functions* of government policy!**





# THE LUCAS CRITIQUE

- Crucial inconsistency in Keynesian macroeconometric approach

This "problem" was always present, but didn't reveal itself until the 1970's

  - The estimated coefficients (the alpha's) themselves may change if policy (monetary and/or fiscal) changes!
  - In which case the macroeconometric approach *cannot* usefully give policy advice – unless one "knows"/makes assumptions about how the alpha's themselves depend on policy…

- Discovered in the 1970's amidst world-wide macroeconomic turbulence caused (seemingly…) by the two oil crises
  - The usual Phillips relation "stopped working" even as policy-makers tried harder than ever to exploit it
  - Led to breakdown of existing macroeconomic theory and opened the door for a complete re-thinking of the basic tenets of macroeconomics

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- Keynesian macroeconometric models are ***not economic models***
  - Merely a statistical description of historical events
  - Economics: the study of how incentives influence behavior of individuals/market participants
  - A damning criticism of the entire macroeconomics profession…





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  - Phase II: The big macroeconometric models
    - Death knell spelled by the devastating Lucas Critique
  - Phase III: Microeconomic foundations and DGE modeling

## THE REBIRTH OF MACROECONOMICS

- Kydland and Prescott (1982), Long and Plosser (1983)
  - A dynamic general equilibrium (DGE) view of business cycles
  - A "real" business cycle (RBC)
    - TFP shocks the driving force, not policy shocks
    - Business cycles are efficient and "natural"…
    - …so macroeconomic policy aimed at stabilizing cycles is unimportant/ misguided
- An economic theory, not a statistical theory
  - Building blocks
    - Consumer preferences
    - Production technology
    - Interactions through markets (goods, labor, and financial markets)
  - The "alpha's" are functions of policy variables (if policy variables present in the model)…
  - …thus immune to Lucas Critique



The Evolution of Macroeconomics: Phase III

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- Modern macro view: periodic ups and downs of macroeconomic activity driven fundamentally by (various and many) shocks to economic fundamentals

# PRINCIPLES OF RBC MACROECONOMICS

- **Basic Tenets**
  - **Markets operate (nearly) perfectly competitively**
  - **Price rigidities/inflexibilities are *not* very important – conceptual break from Keynesian principles**
  - **Model the economic interactions, not merely the statistical relationships – methodological break from Keynesian principles**
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- **How to measure TFP? As a "residual," using Cobb-Douglas production function** $\text{output}_t = A_t f(k_t, n_t) = A_t k_t^{\alpha} n_t^{1-\alpha}$

What's "left over" after accounting for what we can account for

EXAMPLE

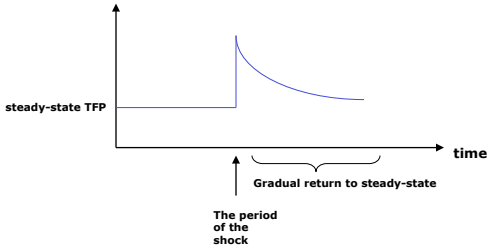
Suppose alpha = 0.5 for simplicity

(U.S. economy: alpha ≈ 0.30)

| Period | Output | Capital | Labor | TFP | |
|---|---|---|---|---|---|
| 2007 | 12.0 | 16 | 9 | 1.0 | |
| 2008 | 14.4 | 16 | 9 | 1.2 | Productivity improved between 2007 and 2008 |
| 2009 | 19.2 | 16 | 16 | 1.2 | Productivity stagnated between 2008 and 2009 |
| 2010 | 17.6 | 16 | 16 | 1.1 | Productivity declined between 2009 and 2010 |

# TFP SHOCKS

- Shocks to TFP are persistent
  - Once $A_t$ rises unexpectedly, TFP tends to stay elevated for multiple periods
  - Example: If $A_{2000} > A_{1999}$, then $A_{2001}$ is likely to be higher than $A_{1999}$ as well, but not as large as $A_{2000}$
  - A slowly-dampening time-profile of TFP





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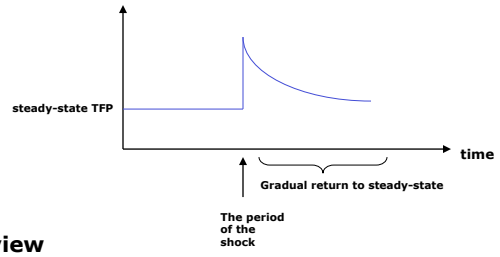
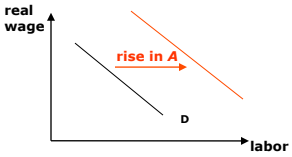



- RBC view
  - Persistent TFP shocks the driver of business cycles
  - NOT policy shocks

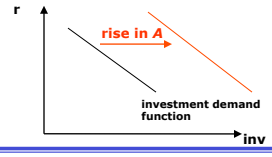
Over two-thirds of business-cycle fluctuations driven by TFP shocks

# RBC Mechanism: An Example

- Positive TFP shock occurs (i.e., TFP rises)
  - Effect on labor market: rise in $A_t$ → rise in $MPN_t$ → shift in labor demand




  - Effect on capital demand: rise in $A_t$ → rise in $A_{t+1}$ (because shocks are persistent) → rise in $MPK_{t+1}$ → shift in capital demand





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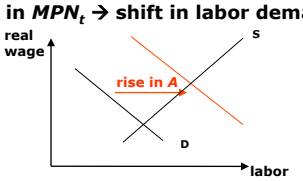


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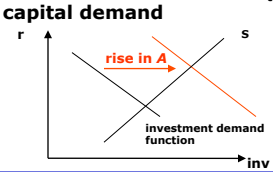


Superimposing the supply sides of the labor and capital markets:

1. Investment (one of the components of GDP) rises
2. EQUILIBRIUM quantity of labor rises…
3. Hence total output (i.e., GDP) rises (because both $A_t$ and $n_t$ rise)

TFP shocks lead to fluctuations in GDP

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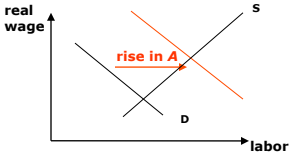


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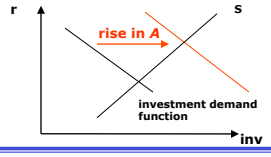


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What is TFP? Could be…

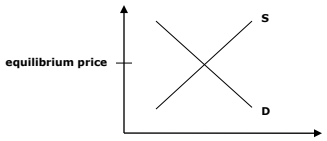
1. Literally technology (better computers, etc.)
2. Better-educated workers
3. More open international trade
4. Financial market conditions
5. …





# Understanding Equilibrium

- Prices coordinate activity of suppliers and demanders (whether *P*, *w*, or *r*; basic idea same in any market)




- Macro markets (suppose no taxes anywhere for simplicity)

CONSUMERS

Consumption-leisure optimality condition

$$\frac{u_l(c_t, l_t)}{u_c(c_t, l_t)} = w_t$$

Consumption-savings optimality condition

$$\frac{u'(c_t)}{\beta u'(c_{t+1})} = 1 + r_t$$

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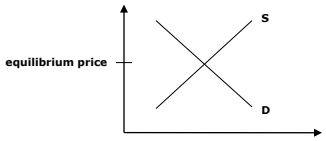


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**FIRMS**

$w_t = mpn_t (= A_t f_n(k_t, n_t))$ **Optimal labor demand**

$r_t = mpk_t (= A_t f_k(k_t, n_t))$ **Optimal investment demand**





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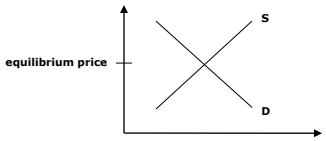


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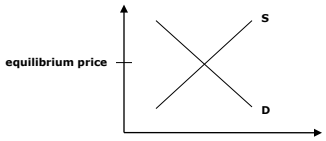


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$$\frac{u_l(c_t, l_t)}{u_c(c_t, l_t)} = mpn_t$$ EQUILIBRIUM IN THE LABOR MARKET

$$\frac{u'(c_t)}{\beta u'(c_{t+1})} = 1 + mpk_t$$ EQUILIBRIUM IN THE CAPITAL MARKET

- Prices anonymously coordinate activity of suppliers and demanders
  - "Invisible hand" described by Adam Smith (*Wealth of Nations*, 1776)





## WHERE IS MACROECONOMICS TODAY?

- Keynesian Macroeconomics
  - Ideology: Price rigidities/"sticky prices"
  - Policy stance: policy (fiscal and monetary) of crucial importance for macroeconomic performance
  - Methodology: econometric/statistical modeling
- RBC Macroeconomics
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The Evolution of Macroeconomics: Next?

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- **A central issue in macroeconomics: monetary neutrality?**
  - **Does monetary policy have long-lasting effects on *real* economy?**