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)
The Phases of Macroeconomics

Three (four?) 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)
- 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

  
  Basic tenet: various "rigidities" in many markets lead to "disequilibria" that can last a long time
THE BIRTH OF MACROECONOMICS

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    - Basic tenet: various "rigidities" in many markets lead to "disequilibria" that can last a long time
    - 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
  - Actual GDP (or virtually any real economic series...)
  - Long-run trend of GDP
    -- a linear trend very simple; but can also construct (more nuanced) nonlinear trends (statistics and econometrics)

- 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"

Under the "no" view, a separation of fields
- Studying the trend ("economic growth" and "development")
- Studying the fluctuations ("macroeconomics")
**B**USINESS Cycles

- Decompose time series into trends and cycles

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<table>
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Highlight the business cycle movements by subtracting trend GDP from actual GDP (i.e., red line minus blue line). Procedure referred to as “detrending” macroeconomic data.

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**P**RINCIPLES 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

- 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”
**THE BIRTH OF MACROECONOMICS**

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

\[
\begin{align*}
X_t &= \alpha_0 + \alpha_1 X_{t-1} + \alpha_2 X_{t-1} + \ldots \\
Y_t &= \beta_0 + \beta_1 Y_{t-1} + \beta_2 Y_{t-2} + \ldots \\
M &= \gamma_0 + \gamma_1 M_{t-1} + \gamma_2 M_{t-2} + \ldots \\
\end{align*}
\]

Dozens or hundreds of variables and equations, some of which describe how policy affects the economy

Say \(x_t\) and \(y_t\) are policy variables
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General idea of Keynesian-inspired macroeconometric models

\[ x_{1t} = \alpha_0 + \alpha_1 y_{13} + \alpha_2 x_{11} + \ldots \]
\[ x_{2t} = \alpha_0 + \alpha_1 y_{13} + \alpha_2 x_{11} + \ldots \]
\[ M = \ldots \]
\[ x_{300t} = \alpha_{000} + \alpha_{001} y_{13} + \alpha_{002} x_{11} + \ldots \]

Dozens or hundreds of variables and equations, some of which describe how policy affects the economy

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

- 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"

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

- 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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  General idea of Keynesian-inspired macroeconometric models
  One of these equations is the Phillips Curve

  \[ x_{t+1} = \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \ldots \]
  \[ x_{t+2} = \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \ldots \]
  \[ M = \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \ldots \]
  \[ x_{t+3} = \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \ldots \]

- Became widely used for policy-making...

THE FALL OF MACROECONOMICS

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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
  - 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...

The Fall 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

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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...

- How to “model” (i.e., conceptually/rigorously/mathematically think about) business cycles?
  - 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

  - 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

Modern macro view: periodic ups and downs of macroeconomic activity driven fundamentally by (various and many) shocks to economic fundamentals
The Evolution of Macroeconomics: Phase III

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

- Which types of shocks are the main driver of business cycles?
  - TFP shocks (not policy – another conceptual break from Keynesianism)

How to measure TFP? As a “residual,” using Cobb-Douglas production function

<table>
<thead>
<tr>
<th>Period</th>
<th>Output</th>
<th>Capital</th>
<th>Labor</th>
<th>TFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>12.0</td>
<td>16</td>
<td>9</td>
<td>1.0</td>
</tr>
<tr>
<td>2008</td>
<td>14.4</td>
<td>16</td>
<td>9</td>
<td>1.2</td>
</tr>
<tr>
<td>2009</td>
<td>19.2</td>
<td>16</td>
<td>16</td>
<td>1.2</td>
</tr>
<tr>
<td>2010</td>
<td>17.6</td>
<td>16</td>
<td>16</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Suppose alpha = 0.5 for simplicity
(U.S. economy: alpha ≈ 0.3)

Productivity improved between 2007 and 2008
Productivity stagnated between 2008 and 2009
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**

**PRINCIPLES OF RBC MACROECONOMICS**

- **RBC view**
  - Persistent TFP shocks the driver of business cycles
  - NOT policy shocks
  - Over two-thirds of business-cycle fluctuations driven by TFP shocks

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The Evolution of Macroeconomics: Phase III

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RBC MECHANISM: AN EXAMPLE

- Positive TFP shock occurs (i.e., TFP rises)
  - Effect on labor market: rise in $A_t \rightarrow$ rise in $MPN_t \rightarrow$ shift in labor demand
  - Effect on capital demand: rise in $A_t \rightarrow$ rise in $A_{t+1}$ (because shocks are persistent) $\rightarrow$ rise in $MPK_{t+1} \rightarrow$ shift in capital demand

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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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. ...

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**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
  \[ u(c_t, l_t) \]
  \[ u'(c_t, l_t) = w_t \]

- Consumption-savings optimality condition
  \[ \frac{u'(c_t)}{\beta u'(c_{t+1})} = 1 + r_t \]

---
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\[ w_t = mpn_t(= A_t f_n(k_t, n_t)) \]  \( \text{Optimal labor demand} \)

\[ r_t = mpk_t(= A_t f_k(k_t, n_t)) \]  \( \text{Optimal investment demand} \)

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UNDERSTANDING EQUILIBRIUM

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

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- 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
  - **Ideology:** Prices are not rigid or "sticky"
  - **Policy stance:** policy (neither fiscal nor monetary) not very important for macroeconomic performance
  - **Methodology:** dynamic general equilibrium modeling
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- **New Keynesian Macroeconomics**
  - **Ideology:** Price rigidities/"sticky prices"
  - **Policy stance:** policy (fiscal and monetary) of crucial importance for macroeconomic performance
  - **Methodology:** dynamic general equilibrium modeling

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

Empirical evidence still EXTREMELY mixed on this

The enduring imprint of the RBC revolution