A New Perspective on the History of Macroeconomics

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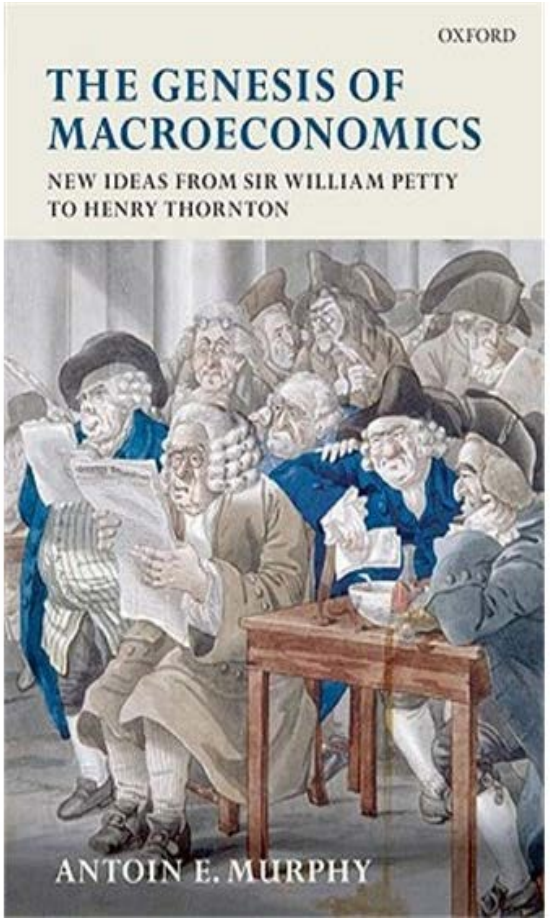
Macroeconomics: The Story We All Know

Macroeconomic Issues are Old

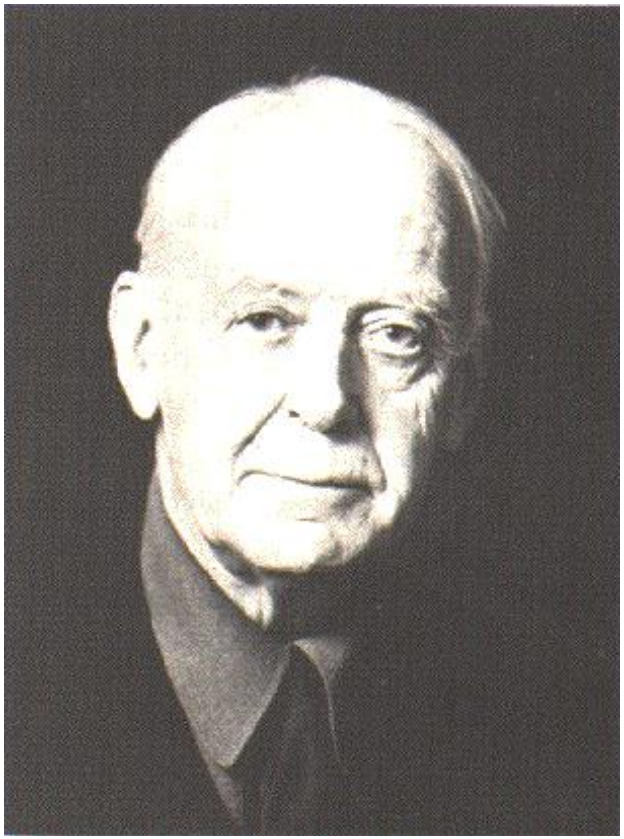


Sir William Petty (1623-1687)

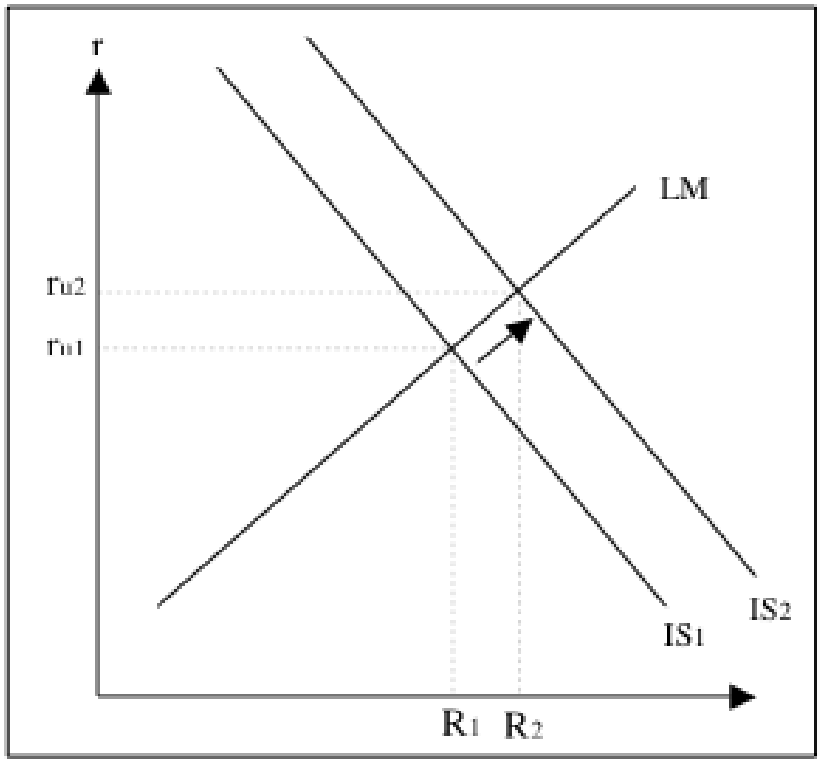
John Maynard Keynes (1883-1946) and *The General Theory of Employment, Interest, and Money* (1936)

The Great Depression
(1929-1939)

"Mr. Keynes and the Classics": The Most Influential Interpretation of the *General Theory*

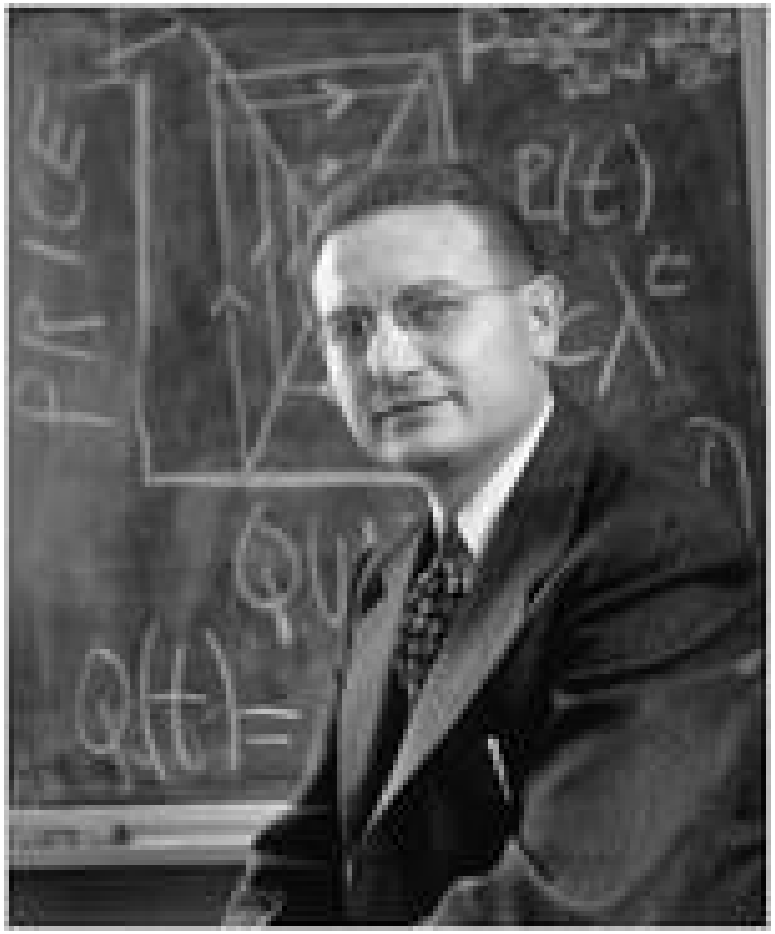


Sir John Hicks
(1904-1989)

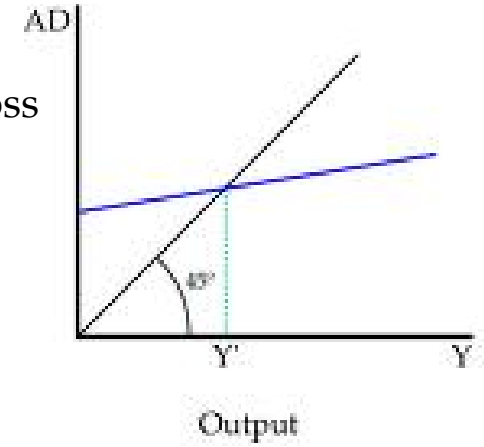


IS-LM Model

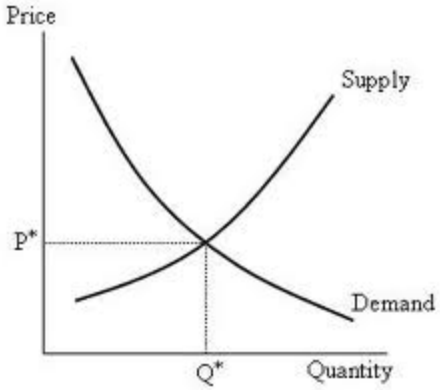
Paul A. Samuelson's Neoclassical Synthesis



The Keynesian Cross



The Classical Cross



The Phillips Curve

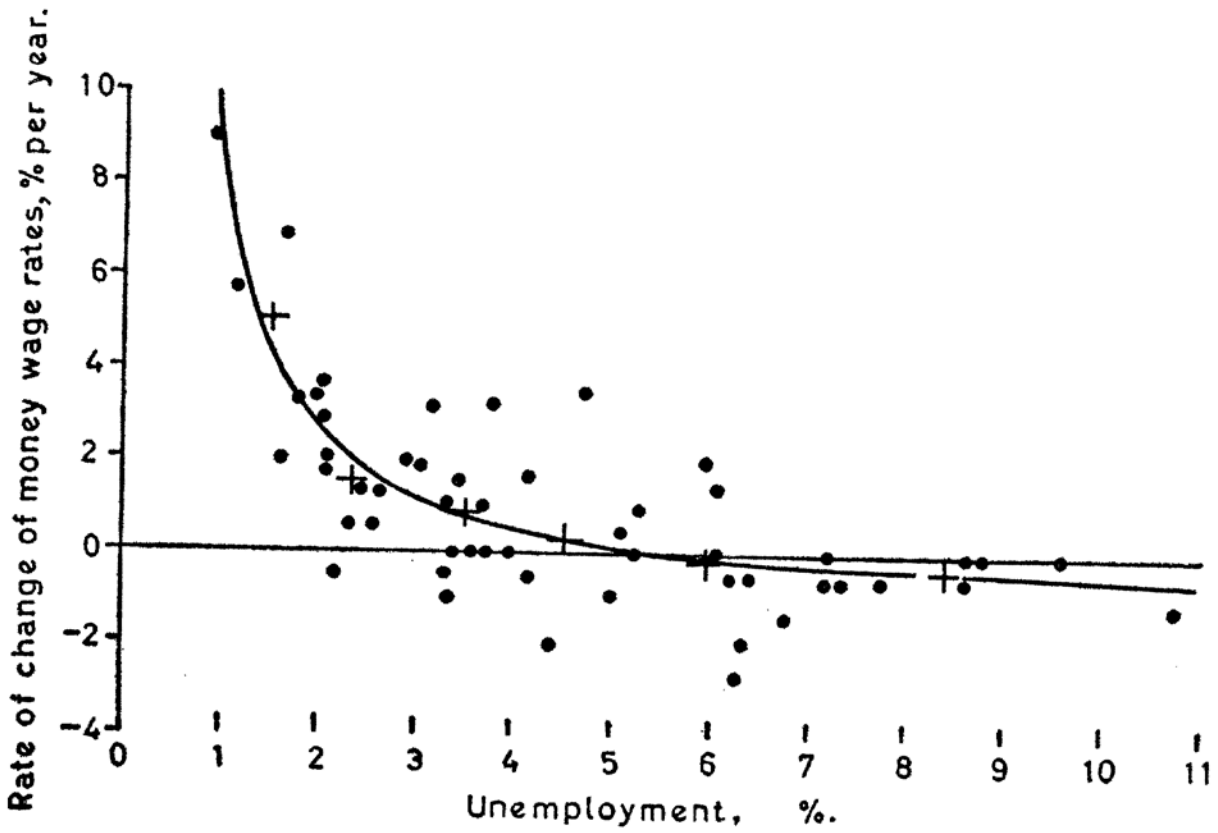
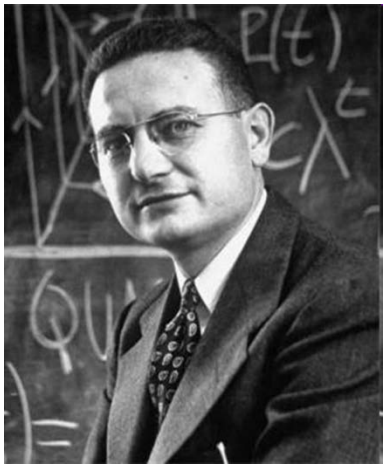


Fig.1. 1861 – 1913

The Price-Phillips Curve



Paul Samuelson
(1915-2009)

Robert Solow
(1926-)

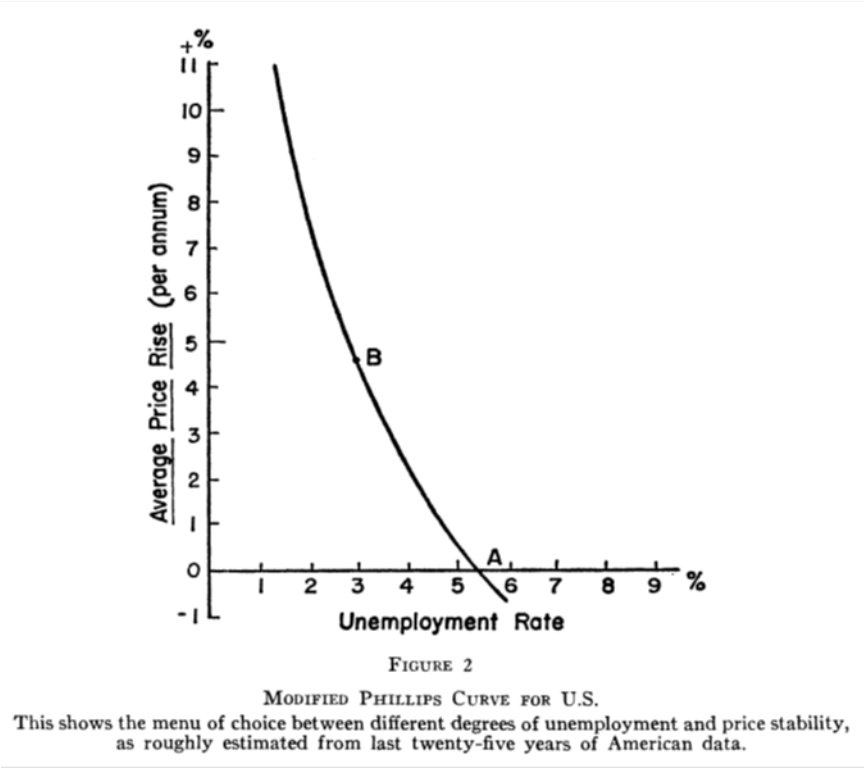


FIGURE 2

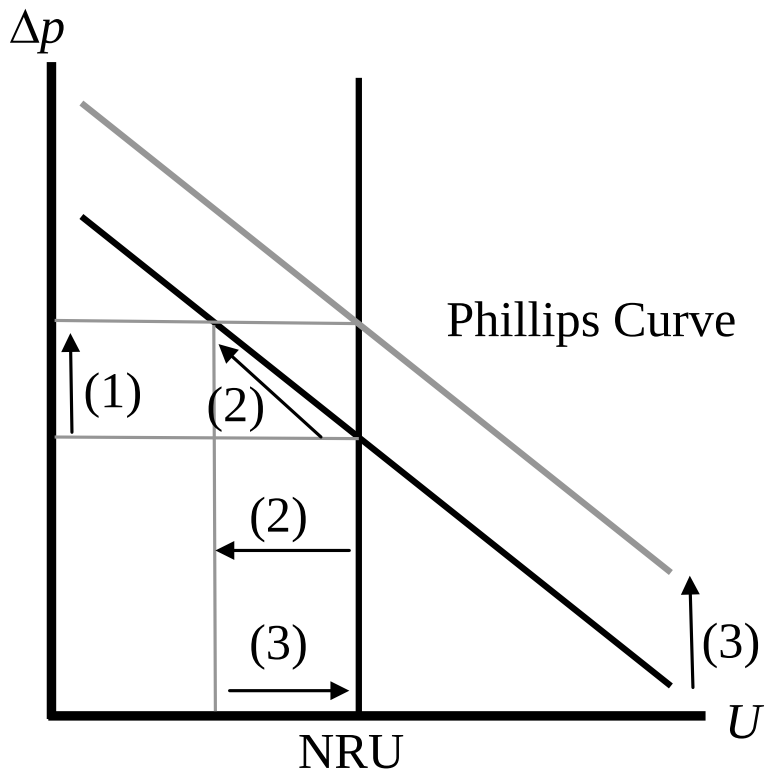
MODIFIED PHILLIPS CURVE FOR U.S.
This shows the menu of choice between different degrees of unemployment and price stability, as roughly estimated from last twenty-five years of American data.

The First Monetarist: The Cassandra of Stagflation

Milton Friedman of Chicago
(1912-2006)

Cassandra of Troy
(c. 1190 BC)

The Expectations-Augmented Phillips Curve and the Natural Rate of Unemployment



1. Expansionary monetary policy raises the inflation rate →
2. Movement along original Phillips curve and ↓U
   - firms see ↓ w/p as w unchanged, so ↑L^D
   - workers see ↑w/p rise when firms begin to compete for labor, so ↑L^S
   - net ↑L rises; ↓U
3. Phillips curve shifts over time as workers adjust expectations to higher rate of inflation and ↑U to NRU

Rational Expectations

John Muth (1930-2005)

Robert Lucas (1937-)

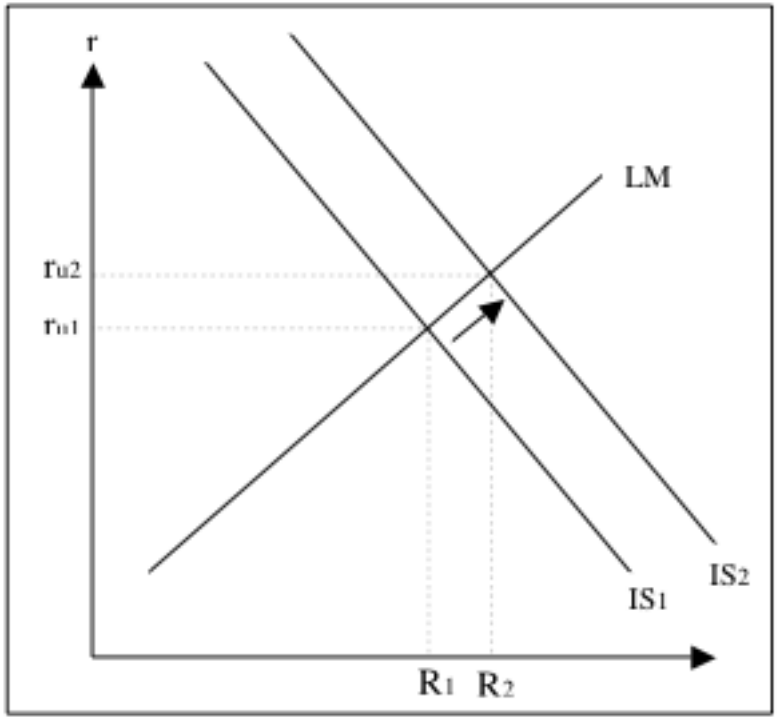
Rational Expectations

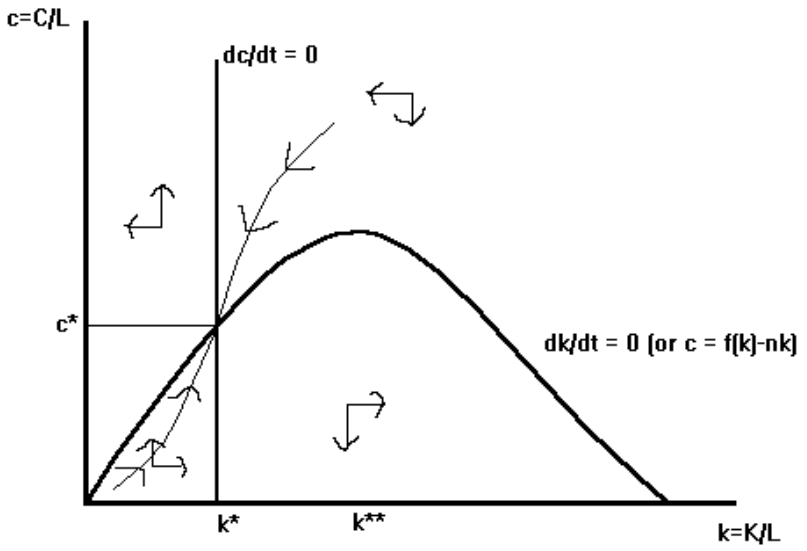
- = expectations agents would hold if they had the true model of the economy
- generates policy ineffectiveness
- implies the "Lucas critique" = aggregate relationships do not remain stable in the face of policy interventions
- microfoundations = solution to the Lucas critique

Technical Progress in Warfare

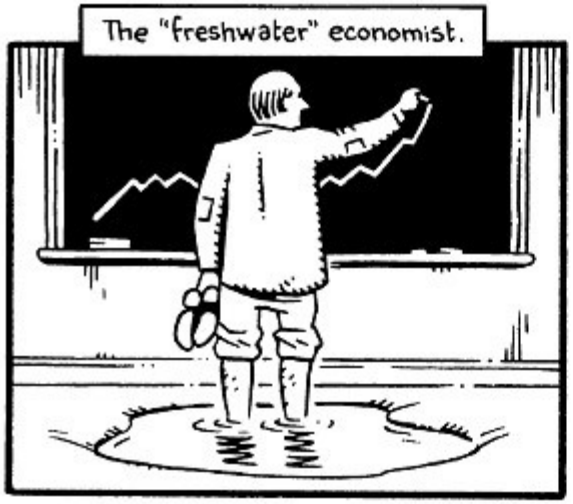
-

Technical Progress in Macroeconomics

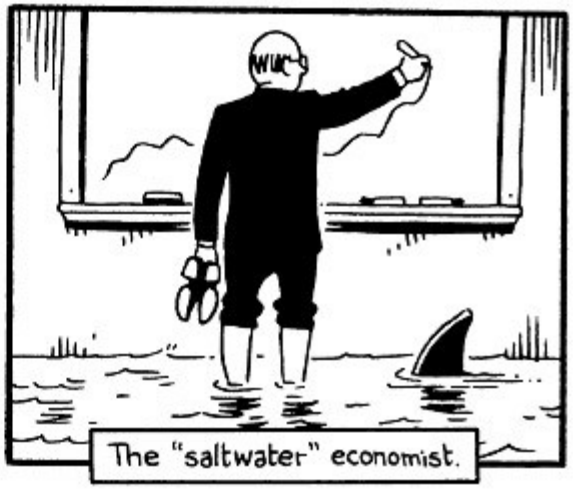




The New Neoclassical Synthesis



New Classical Macroeconomics



New Keynesian Macroeconomics

The Old View: Summing Up

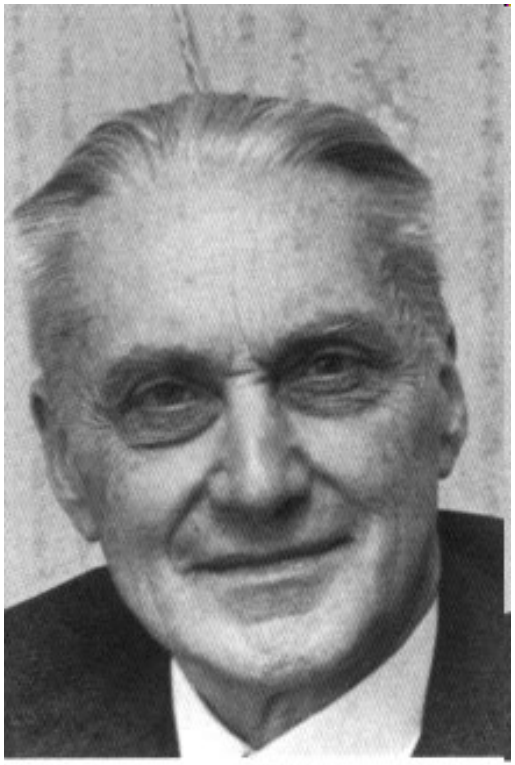
- Keynes is the central figure
- The debate is mainly one over theory
- Role of empirical evidence is either
  - broad: e.g., Great Depression or stagflation; or
  - intermittent: e.g., early Phillips curve studies
- Econometric modeling significant only in its failures (e.g., stagflation)

Macroeconomics: A New Perspective

A Retelling of the Story

- Econometrics vital
- Different key players
- Microfoundations an issue in the 1930s and 1940s, not first in the 1970s

Ragnar Frisch

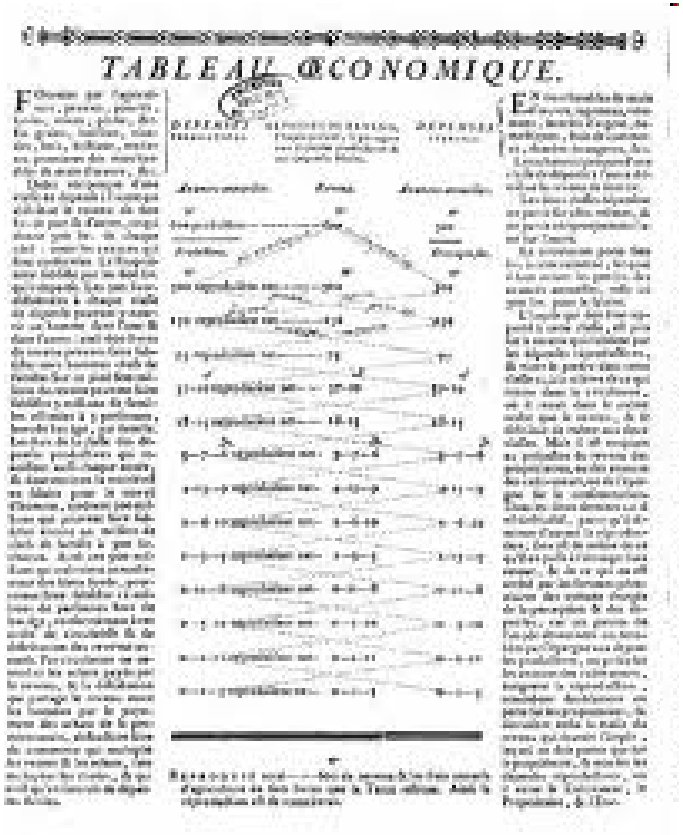


Ragnar Frisch

Ragnar Frisch (1895-1973), Nobel Laureate (1969)

- Inventor of important terminology:
  - *microeconomics/macroeconomics*
  - *econometrics*
- Influential in development of:
  - dynamic economics
  - econometric (empirical) methods
- Creator of modern professional institutions
  - Founder of Econometric Society
  - First editor of *Econometrica*

Frisch's Vision: Two Versions of the Tableau Economique



François Quesnay 1759

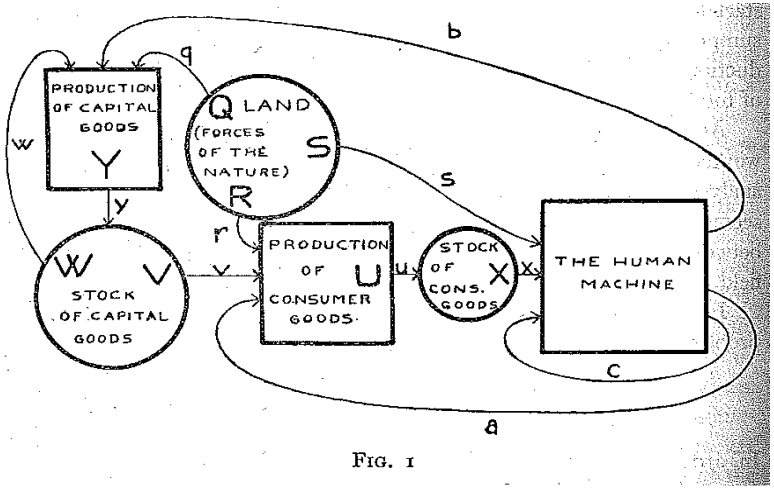


FIG. 1

Ragnar Frisch 1933

Macroeconomics Dynamics

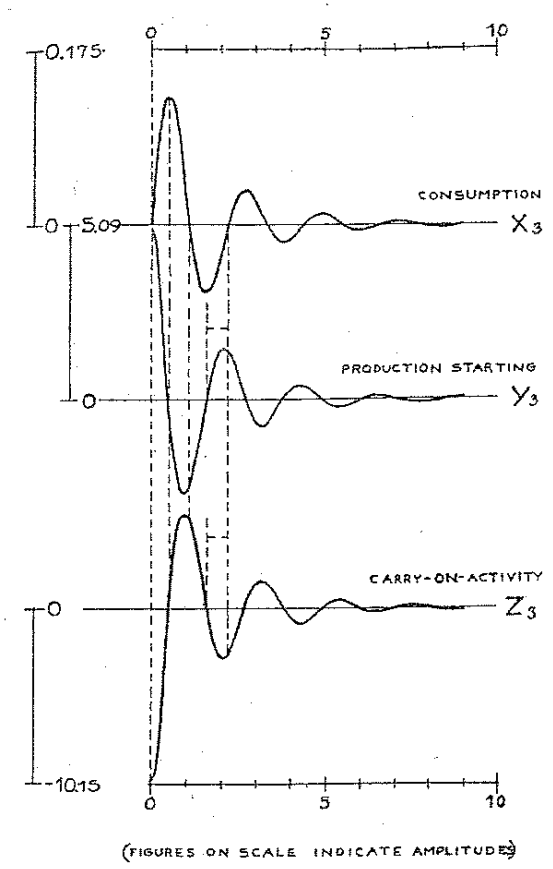


Figure 6.3 Frisch's cycles obtained from the model of PPIP.

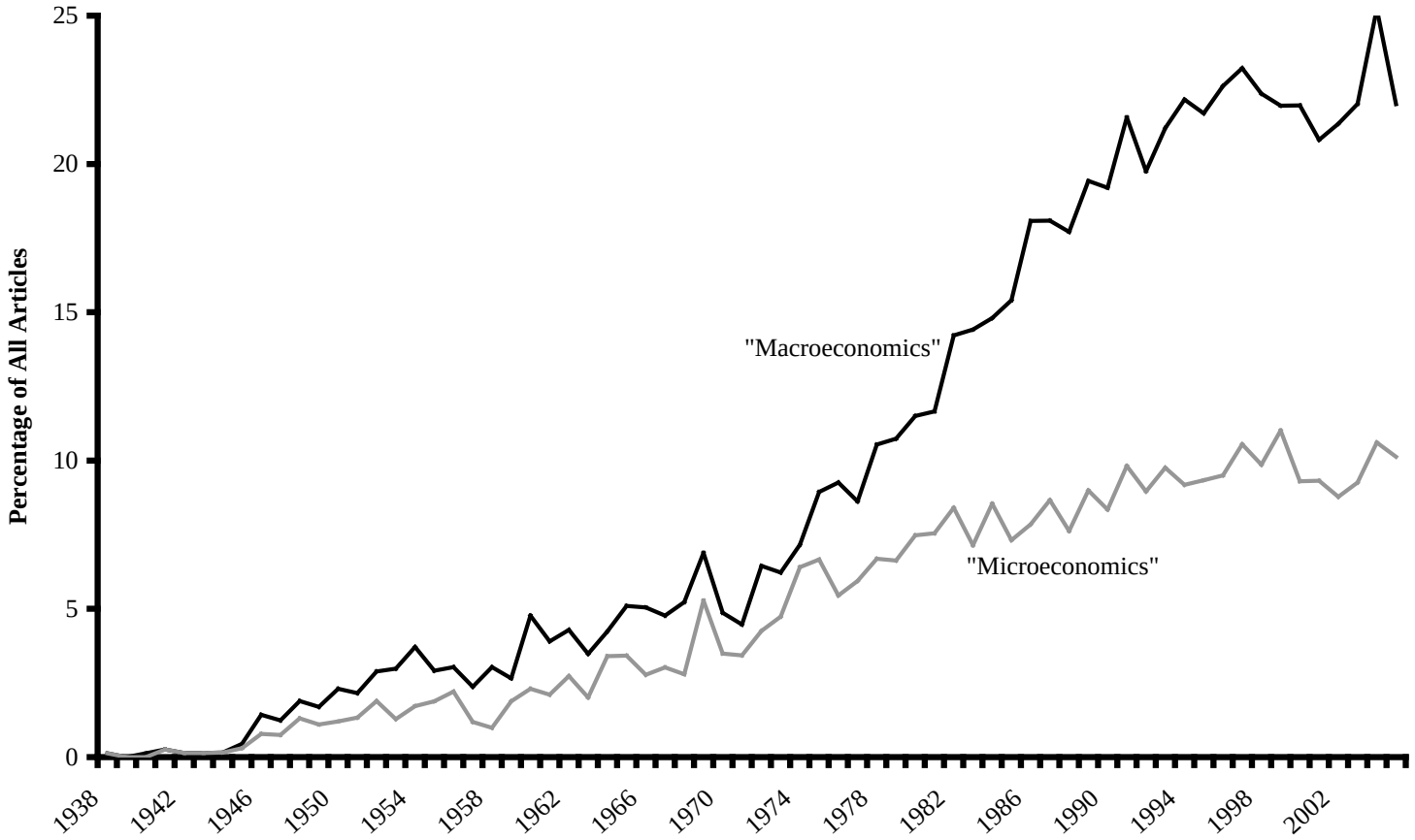
Jan Tinbergen and Applied Macroeconometrics

Jan Tinbergen (1903-1994)

- Trained as physicist
- Created first modern econometric models:
  - Smaller Dutch model
  - Larger U.S. model
- Two-volume study of U.S. business cycles for the League of Nations (1939)
  - methodology and application
  - object of Keynes's attack on econometrics

The Slow Diffusion of the Micro/Macro Distinction

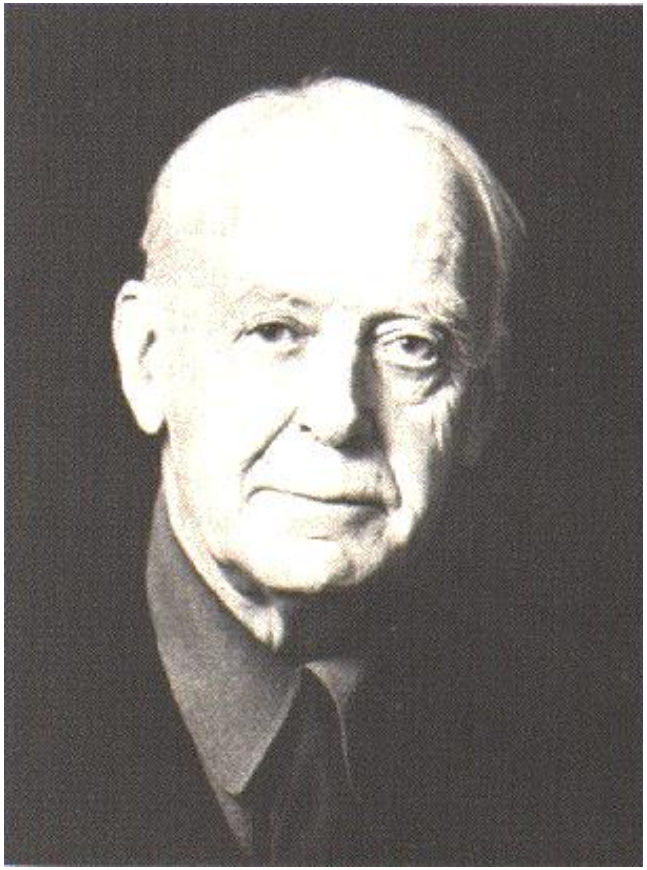
Figure 1
The Diffusion of "Microeconomics" and "Macroeconomics"



Keynes Meets Frisch and Tinbergen – 1: The Cowles Commission

- Cowles Commission for Research in Economics founded in 1932 by Alfred Cowles
- Moved to Chicago in 1939
- Early research:
  - Econometric methodology (especially structural macromodels)
  - General equilibrium models

Keynes Meets Frisch and Tinbergen – 2: Hicks



Sir John R. Hicks (1904-89), Nobel Laureate (1972)

- *Value and Capital* (1939): Keynes in light of Walras
- Dynamics of type Frisch thought impractical
- Formal analysis of aggregation
- The IS-LM Model

Keynes Meets Frisch and Tinbergen – 3: Modigliani

Franco Modigliani (1918-2003), Nobel Laureate (1985)

- 1944 *Econometrica* paper
- Less well-known than Hicks
- But closer connection to macroeconometric modeling and later developments in finance and rational expectations

The Central Figure in Postwar Macroeconomics

Lawrence Klein (1920- 2013), Nobel Laureate (1980)

- Keynesian
  - *The Keynesian Revolution* (1944/47)
- At Cowles Commission:
  - Walrasian
  - Econometrician
- Sustained program of large-scale macroeconometric modeling

IS-LM-AS Sets the Agenda for Macroeconmetric Models

Consumption Function

$C = C(Y, T \ldots)$ $\quad 0 < C' < 1$

Investment Function

$I = I(r, Y, \Delta Y, \tau \ldots)$ $\quad I' < 0$

} IS

Money Demand:

$M^D = L(Y, r \ldots)$

} LM

} AD

Production Function:

$Y = Y(K, L)$

$\partial Y/\partial K > 0$, $\partial Y/\partial L > 0$; $\partial^2 Y/\partial K^2 < 0$, $\partial^2 Y/\partial L^2 < 0$

Labor Demand:

$L^D = L^D(K, w/p \ldots)$

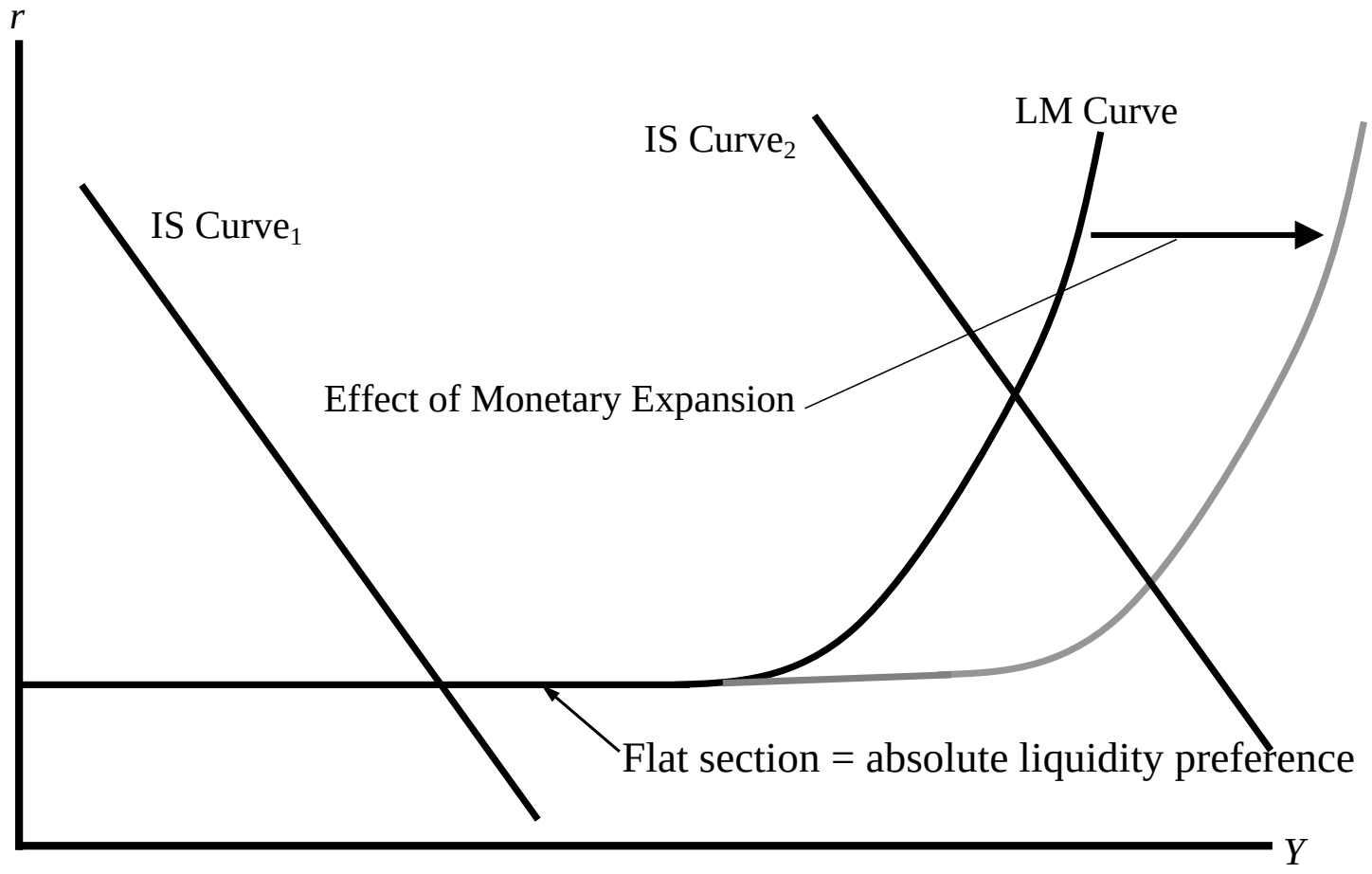
Labor Supply:

$L^S = L^S(w/p \ldots)$

} Factor Markets

} AS

Hick's IS-LM Interpretation of Keynes



Hydraulic Macroeconomics

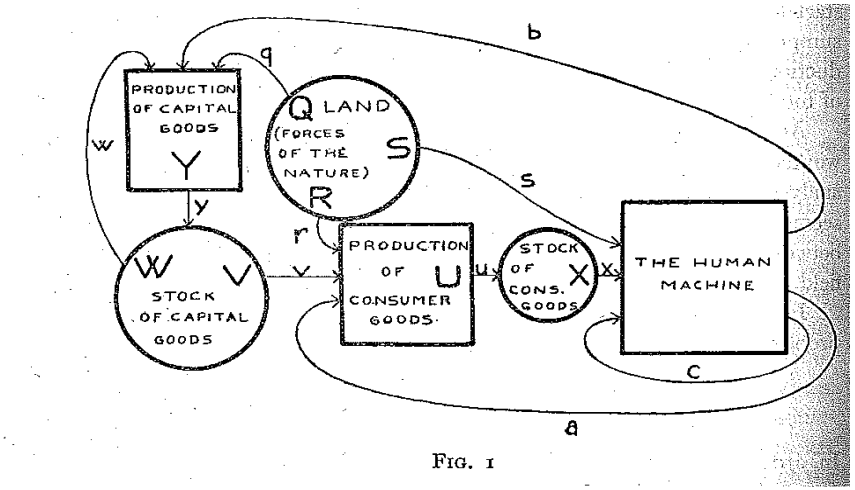
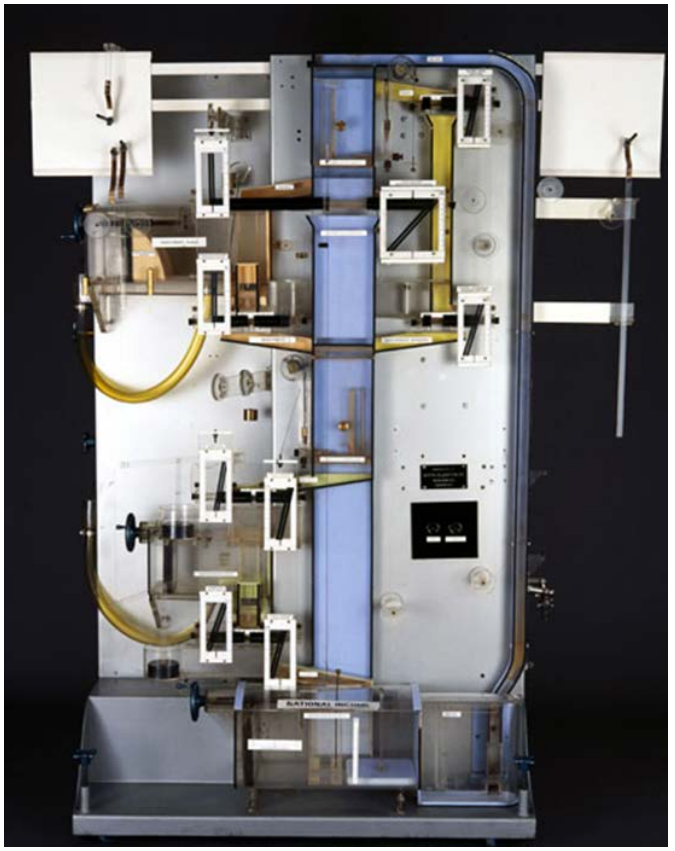


FIG. 1

Ragnar Frisch 1933



The Phillips Machine (c. 1950)

Phillips Machine: Schematic

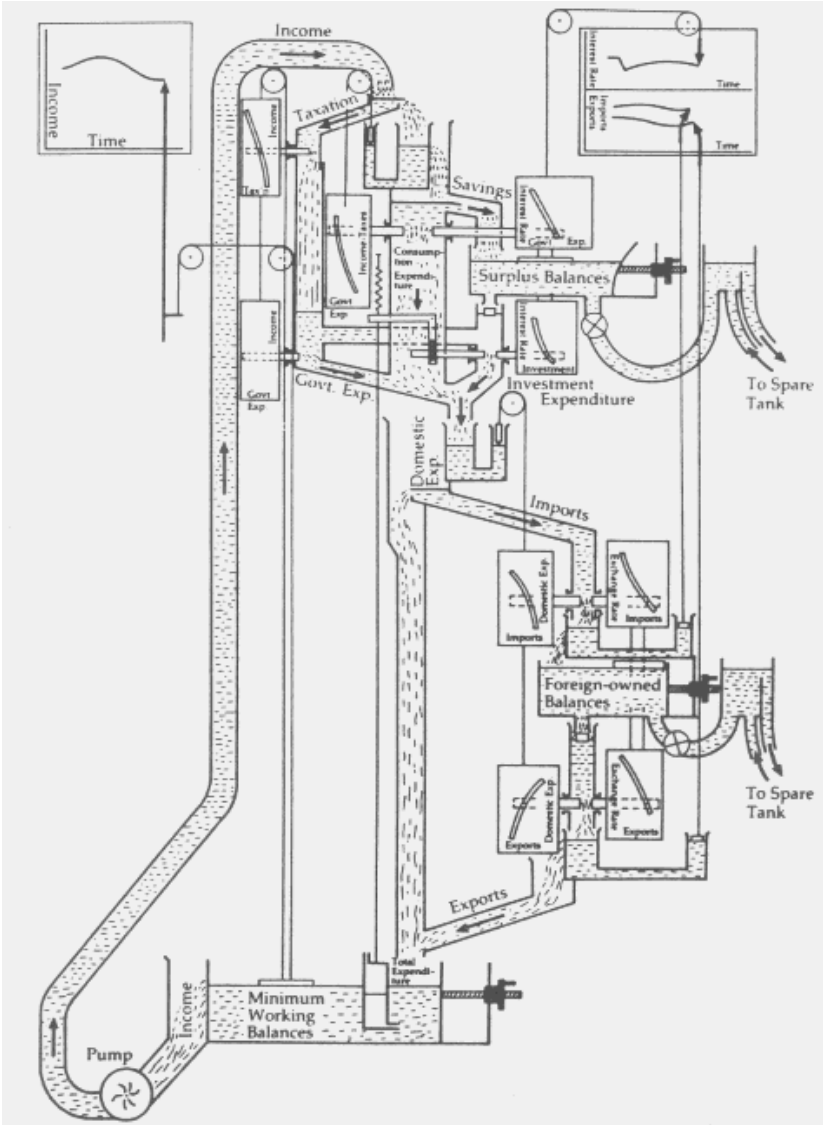
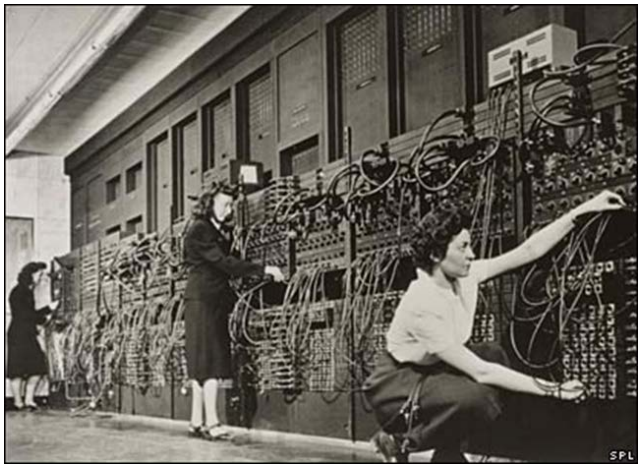


Diagram of the Phillips machine. Source: LSE Quarterly, Winter 1988, Nick Barr.

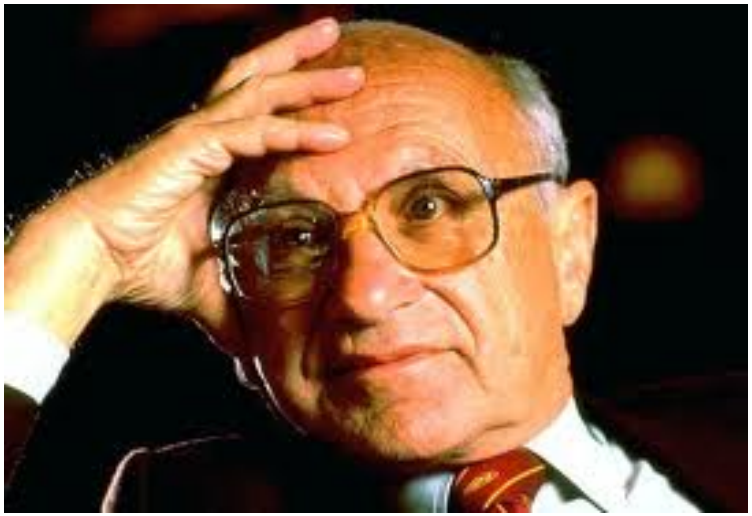
Computing Power: The Key to Klein's Program



Klein's Modeling Agenda

In contrast with the parsimonious view of natural simplicity, I believe that economic life is enormously complicated and that the successful model will try to build in as much of the complicated interrelationships as possible. That is why I want to work with large econometric models and a great deal of computer power. Instead of the rule of parsimony, I prefer the following rule: the largest possible system that can be managed and that can explain the main economic magnitudes as well as the parsimonious system is the better system to develop and use. [Klein 1992]

An Opposing Current

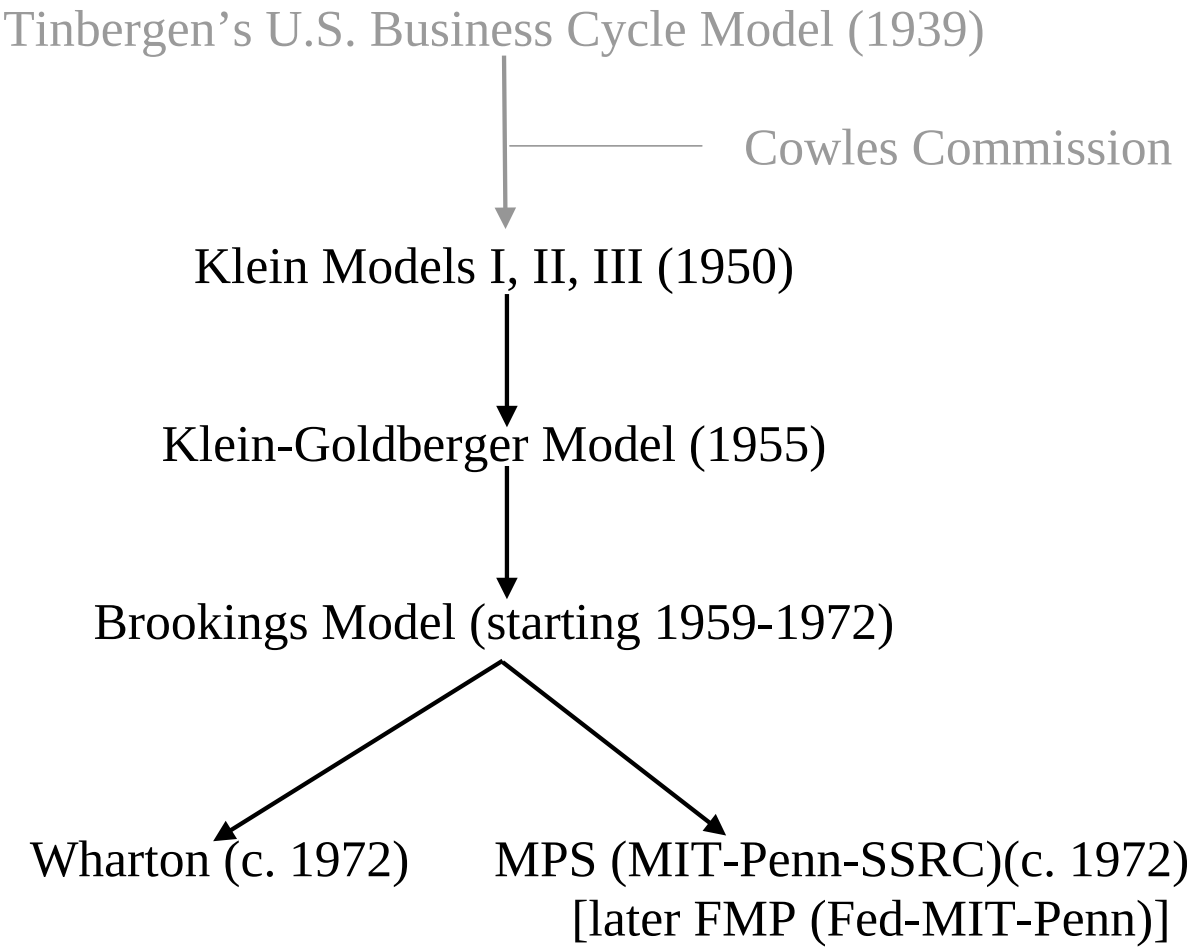


Milton Friedman (1912-2006)

the focus should be on the analysis of parts of the economy in the hope that we can find bits of order here and there and gradually combine these bits into a systematic picture of the whole [1951]

A hypothesis is important if it "explains" much by little, that is, if it abstracts the common and crucial elements from the mass of complex and detailed circumstances surrounding the phenomena to be explained and permits valid predictions on the basis of them alone. [Friedman 1953, p. 14]

Genealogy of Klein's "Keynesian" Macroeconometric Models



Complexity of Klein's Models

Model	Number of Equations
Klein Model I (1950)	6
Klein Model II (1950)	3
Klein Model III (1950)	12
Klein-Goldberger (1955)	25
Brookings-early (1959)	about 200
Brookings-late (1972)	about 400

Brookings Model (1965)

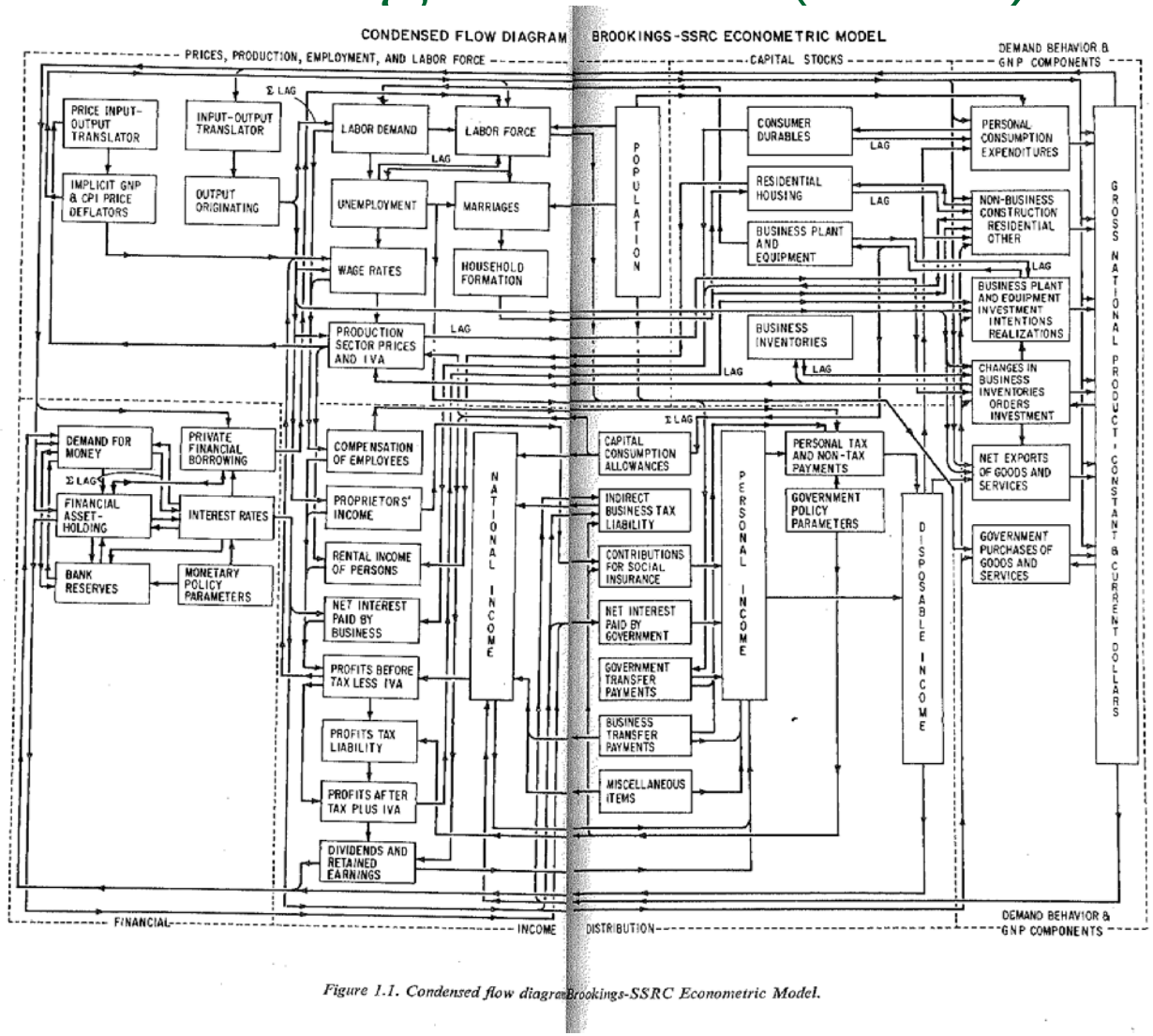


Figure 1.1. Condensed flow diagram Brookings-SSRC Econometric Model.

Phillips Machine: Schematic

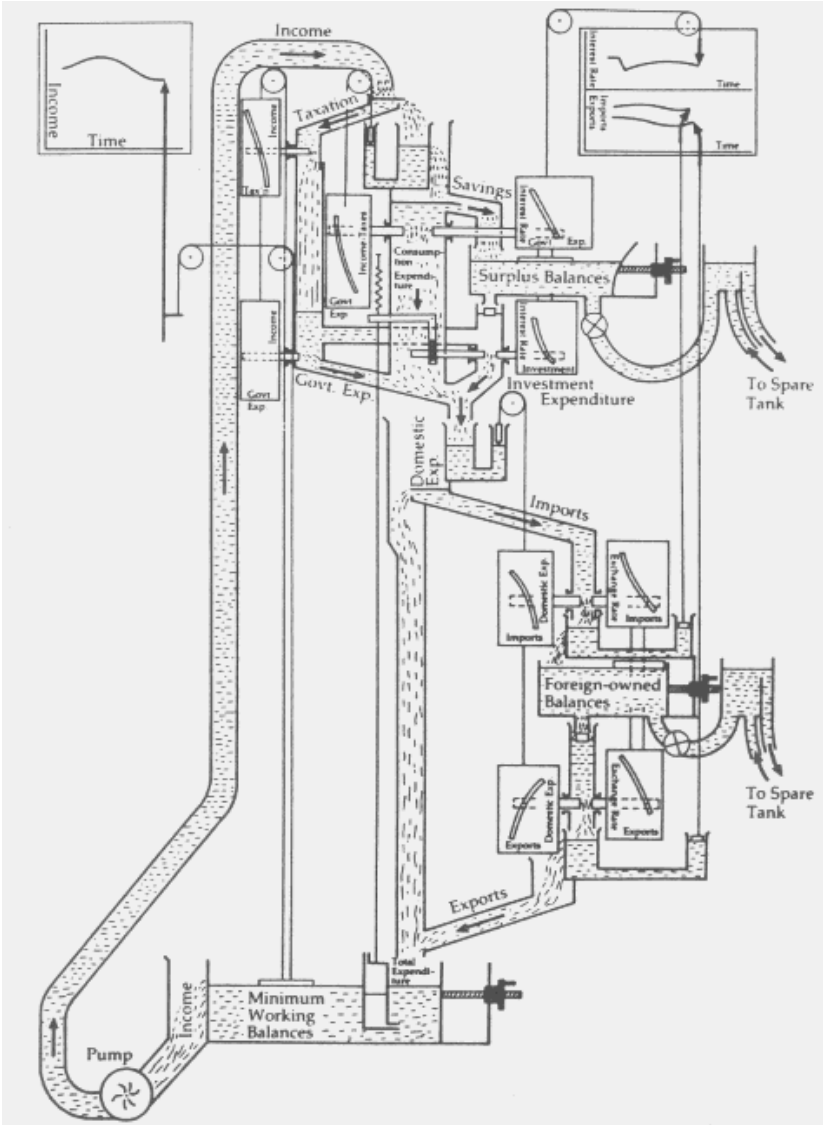


Diagram of the Phillips machine. Source: LSE Quarterly, Winter 1988, Nick Barr.

The IS-LM Core of a Large-scale Macroeconometric Model

Figure 4.4. 1987.1 IS curves.

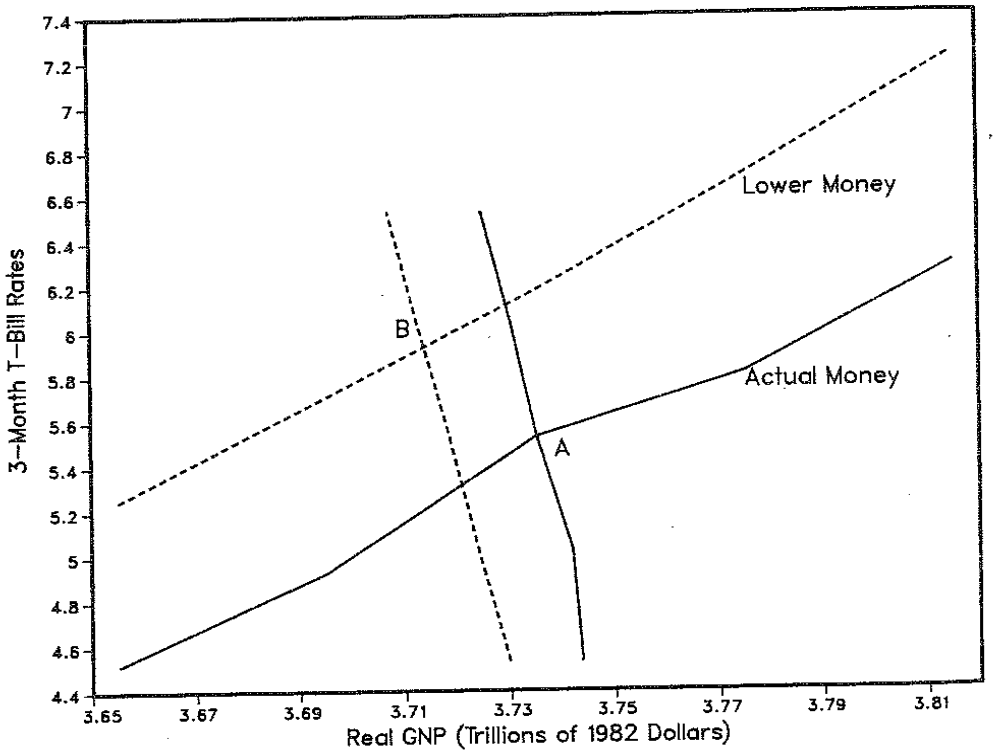


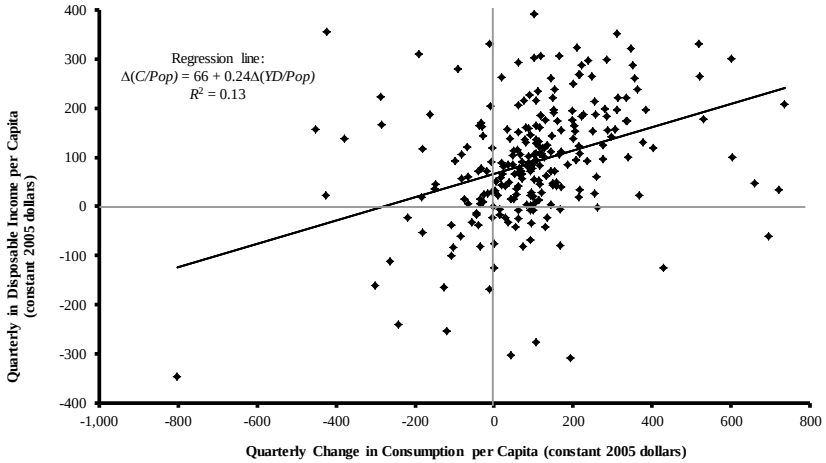
Figure 4.5. Long-run IS–LM curves.

Source: Green et al. "The IS-LM Cores of Three Econometric Models," in Lawrence Klein (editor) *Comparative Performance of U.S. Econometric Models,* p. 104.

The "Keynesian" Microfoundational Program: An Illustration: The Consumption Function

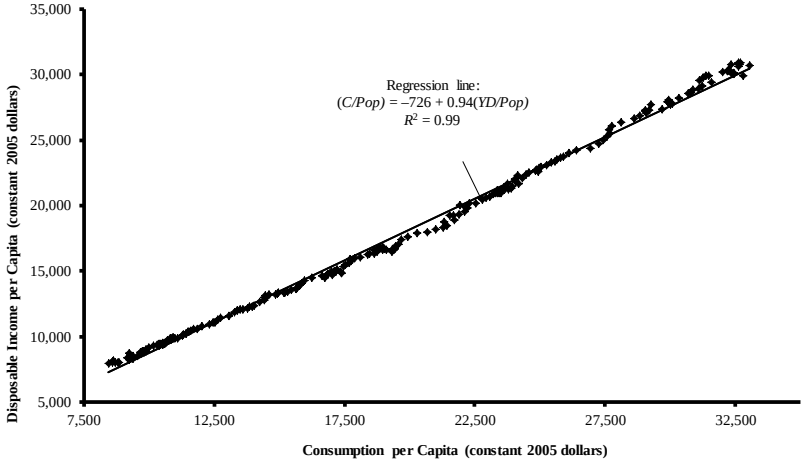
Short-run consumption function

Figure 14.3
The Short-run U.S. Consumption Function, 1947-2009



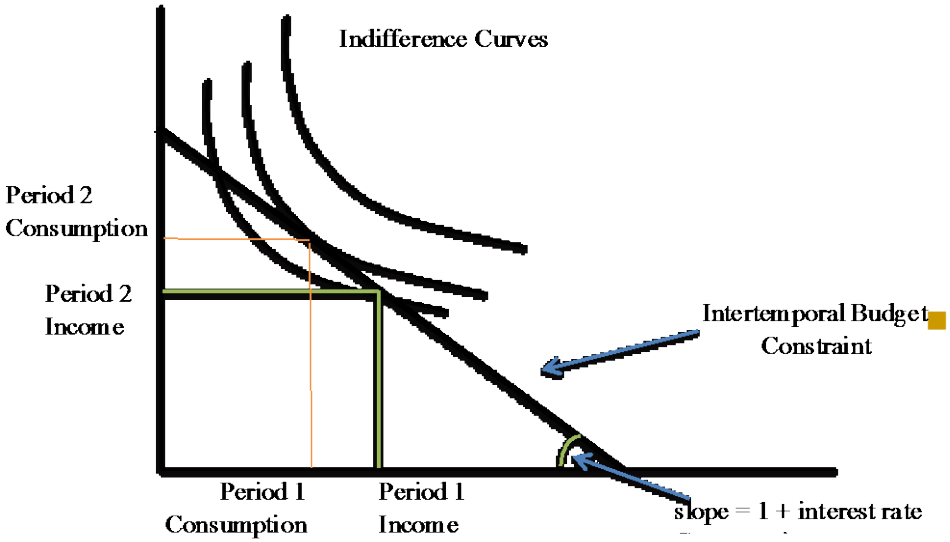
Long-run consumption function

Figure 14.2
The Long-run U.S. Consumption Function, 1947-2009



Example Continued: the Permanent-Income or Life-Cycle Hypothesis

Individual Intertemporal Optimization Problem



Qualitative Analogies

- Resolution of the Puzzle
  - consumption related to asset value of income stream
  - transitory income adds little to asset value → low mpc in short run
  - transitory income cancels out over time →higher mpc in long run
- Macroeconomic Implications
  - Include interest rate
  - distinguish populations wage and salary earners from self employed
  - separate analysis for nondurable consumption and durable consumption goods

The "Keynesian" [i.e., Kleinean] Macroeconometric Strategy

- Individual optimization analysis for each of the main "functions" in the macroeconomic model:
  - consumption function
  - investment function
  - money demand and supply functions
  - labor demand and supply functions
  - production functions
- Use results as qualitative analogies:
  - variable choice
  - disaggregation
  - choice of functional form
- Test at aggregate level

The Origins of Rational Expectations in Microeconomic Investment Analysis

Herbert Simon
(1916-2001)

Franco Modigliani
(1918-2003)

- Simon
  - "the god of the Graduate School of Industrial Administration" – Robert Lucas.
  - certainty equivalence and self-fulfilling prophecy
  - Grunberg and Modigliani (1954) on public predictions
  - preference for behavioral assumptions: satisficing and all that.
- Project on Expectations and Investment → Holt, Modigliani, Muth, and Simon *Planning Production, Inventories, and Work Force* (1960)

Rational Expectations

- Lucas and Rapping c. 1970
  - labor supply = "Keynesian" piecemeal microfoundations
  - introduced Muth's expectations into macro
- Rational expectations
  - = systems property → general equilibrium
  - early RE models = IS/LM
  - expectations are individual → microfoundations natural development

The Lucas Critique Again

- Target: not Keynes, but Klein and Tinbergen
  - shift to general equilibrium microfoundations
  - deep parameters: only tastes and technology given
  - policymakers inside the model vs. the engineering vision (Tinbergen's targets-and-instruments framework)
  - eliminative microfoundations:
    If these developments succeed, the term "macroeconomics" will simply disappear from use, and the modifer "micro" will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall, and Walras, of economic *theory*. Lucas (1987)

The Challenge of General Equilibrium Microfoundations

Finn Kydland & Edward Prescott
(Nobel laureates 2004)

- Technical infeasibility:

  Kahnemann and Tversky haven't even gotten to two people; they can't even tell us anything interesting about how a couple that's been married for ten years splits or makes decisions about what city to live in – let alone 250 million. This is like saying that we ought to build it up from knowledge of molecules or – no, that won't do either, because there are a lot of subatomic particles – we're not going to build up useful economics in the sense of things that help us think about the policy issues that we should be thinking about starting from individuals and, somehow, building it up from there. [Lucas 2013]

- The representative-agent model
  - origin: optimal growth models
  - Lucas's business cycle model (1975)
  - Kydland & Prescott's real-business-cycle model (1982)
  - Dynamic-stochastic general-equilibrium models (DSGE) (c. 1990)

Standing Problems

- The infeasibility of aggregation
  - Klein's strategy: top-down, analogical
  - RA strategy: bottom up, deductive
- The New Classical Macro vs. the engineering vision
  - preserving intentionality: incentives, choice, optimization
  - capturing intentionality in the most machine-like way:

> *Our task as I see it . . . is to write a FORTRAN program that will accept specific economic policy rules as 'input' and will generate as 'output' statistics describing the operating characteristics of time series we care about, which are predicted to result from these policies.*
>
> Lucas (1980)

Lessons of History of Macroeconomics

- Internal logic trumps ideology
- Big, big changes fall short of revolution
- Tension between empirical detail and capturing intentional behavior → compromise
  - Klein's ≠ Lucas & Co.
  - not clear that currently popular course is superior

Thanks

The End