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# Microfoundational Programs

Kevin D. Hoover

Department of Economics  
Department of Philosophy  
Duke University  
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## Mainstream Narrative

- New Classical (e.g., Lucas, Sargent) and New Keynesian (Blanchard)
- Failures of Keynes and the Keynesians:
  - ignores microeconomic behavior
  - ignores general equilibrium

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## Mainstream Narrative: Lucas on Keynes

- *The decision on the part of [Keynes] the most prestigious theorist of his day freed a generation of economists from the discipline imposed by equilibrium theory, and . . . this freedom was rapidly and fruitfully exploited by macroeconometricians.*

Robert E. Lucas, Jr.

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## Mainstream Narrative: Intellectual Technical Progress – 1

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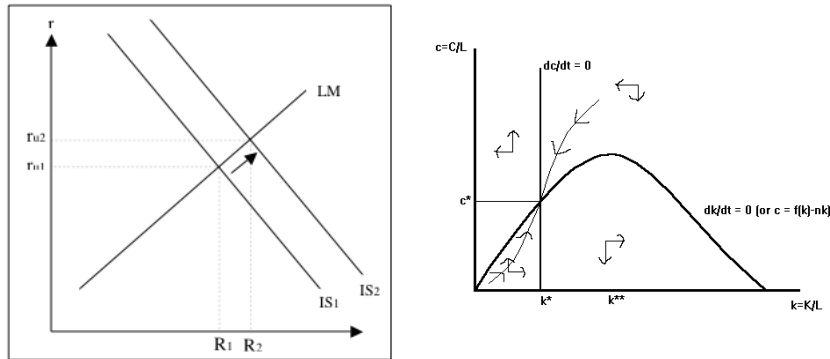


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## Mainstream Narrative: Intellectual Technical Progress – 2



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## Mainstream Narrative: Rational Expectations

- Rational expectations = expectations agents would hold if they had the true model of the economy
- Avoids exploitable arbitrage opportunities
- Requires complete model and, therefore, general equilibrium

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## Mainstream Narrative: Lucas Critique

- Macroeconometric relationships not structural, but the result of optimization in stable environments
- Not invariant to changes in environment
- Stable relationships must be grounded in individual decision problems
  - Lucas: take only tastes and technology as given
  - Sargent: beyond demand and supply curves

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## Mainstream Narrative: Representative-agent Models

- Representative agent = a single-agent or a small number of agents representing types (e.g., firms or consumers; rich and poor; old and young)
- Representative-agent models provisionally adequate
- May pursue more heterogeneous agents as techniques develop

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## History not Methodology

- My previous methodological attacks on the representative-agent model:
  - “Is Macroeconomics for Real?” *The Monist*, 1995.
  - “Microfoundations and the Ontology of Macroeconomics,” in Harold Kincaid and Donald Ross, editors. *Oxford Handbook of the Philosophy of Economic Science*, 2009.
  - “Idealizing Reduction: The Microfoundations of Macroeconomics,” *Erkenntnis*, forthcoming.
- But the current paper is history.

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## Thesis

- Mainstream narrative distorts history
  - idea of microfoundations coterminous with the distinction between micro and macroeconomics
  - development complex

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## Microfoundational Programs

- Prehistory: Frisch, Keynes, Hicks
- Three Programs
  - General-equilibrium Program:
    - Roy Weintraub's *Microfoundations: The Compatibility of Microeconomics and Macroeconomics* (1979)
    - Maarten Janssen's *Microfoundations: A Critical Inquiry* (1993)
  - Aggregation Program
  - Representative-agent Program
    - James Hartley's *The Representative Agent in Macroeconomics* (1997)
- Emphasize prehistory and aggregation program

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## Bibliographic History

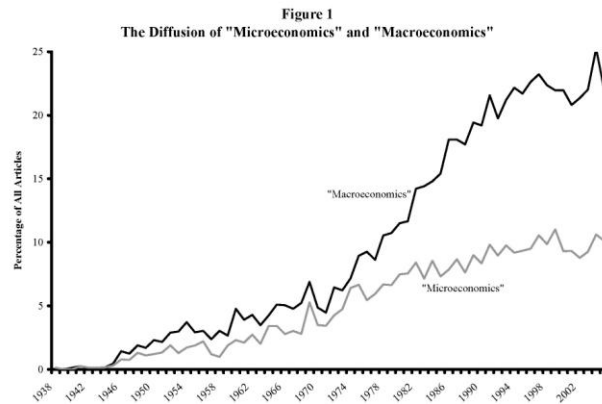
- Ragnar Frisch in Cassel *Festschrift* (1933):  
*microdynamics vs. macrodynamics*
- Frisch in mimeographed lectures (1933/34):  
*mikroøkonomiske vs. macroøkonomiske*
- Jan Tinbergen in *Revue de l'Institut International de Statistique/Review of the International Statistical Institute* (1936): *macroéconomique*
- J.M. Fleming in *Economica* (1938): *macro-economic*
- Ultimate source: Frisch; diffused through early meetings of the Econometric Society

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## Diffusion of the Micro/Macro Distinction



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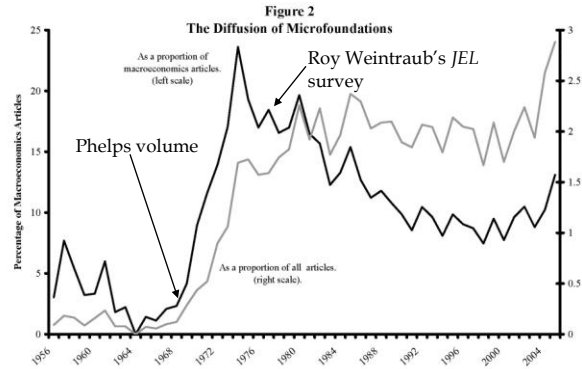
## Origins of Microfoundations

- First use: Sidney Weintraub
  - *microeconomic foundations* (American Economic Review 1956)
  - *micro-foundations* in title and *microeconomic-foundations* in text (Economic Journal 1957)
- Most references before 1970 to Weintraub
- First book title: Edmund Phelps's (editor) *Microeconomic Foundations of Employment and Inflation Theory* (1970)

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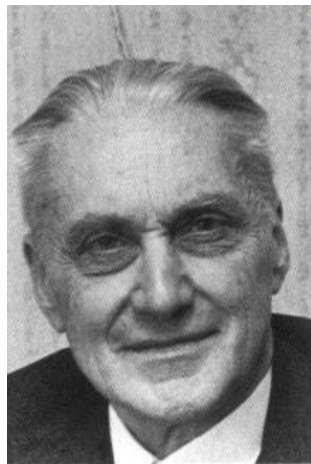
## Diffusion of “Microfoundations”



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## Prehistory – Frisch



Ragnar Frisch

- micro vs. macrodynamics
- econometrics
- pragmatism and aggregation

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## Prehistory – Frisch: Dynamics

- *“micro-dynamic analysis is an analysis by which we try to explain in some detail the behaviour of a certain section of the huge economic mechanism, taking for granted that certain general parameters are given . . .”*
- *“macro-dynamic analysis, on the other hand, tries to give an account of the fluctuations of the whole economic system taken in its entirety.”*
- Macro not built on micro; micro presupposes macro.

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## Prehistory – Frisch: Econometrics and Pragmatic Aggregation

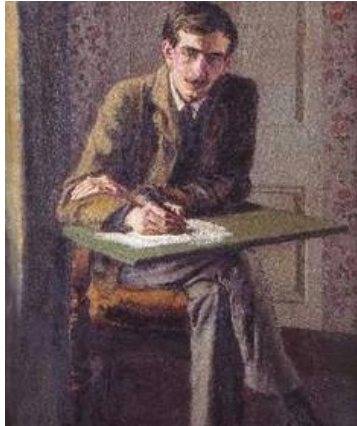
- *“it is always possible to give even a macro-dynamic analysis in detail if we confine ourselves to a purely formal theory . . . Such a theory, however, would only have a rather limited interest” for actual business-cycle problems.*
- *“We may perhaps start by throwing all kinds of production into one variable, all consumption into another, and so on, imagining that the notions ‘production,’ ‘consumption,’ and so on, can be measured by some sort of total indices.”*

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## Prehistory – Keynes



- dynamics
- pervasive micro analysis
- system properties and emergence
- against econometrics

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## Prehistory – Keynes: Dynamics

- *“The real task of [monetary] theory is to treat the problem dynamically, analysing the different elements involved, in such a manner as to exhibit the causal process . . . and the method of transition from one position of equilibrium to another.”*

Treatise on Money

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## Prehistory – Keynes: Microeconomic Analysis

- All the main Keynesian *functions* analyzed microeconomically:
  - consumption function
  - labor supply
  - labor demand
  - liquidity preference
  - investment

## Prehistory – Keynes: Liquidity Preference

- Speculative demand for money
  - normal rate of interest – individual and heterogenous
  - hold bonds if market rate above normal → expected capital gain; hold money if market rate below normal → expected capital loss
  - market rate = rate at which market is divided into balanced groups of bulls and bears
  - no aggregation; market rate = some particular agent's normal rate

## Prehistory – Keynes: Labor Market – 1

- Labor demand: standard firm optimization problem
- Labor supply: not principally money illusion but a relative efficiency-wage argument:
  - “the struggle for money-wages is . . . essentially a struggle to maintain a high *relative* wage . . .”
    - General Theory
  - Kevin Hoover, “Relative Wages, Rationality, and Involuntary Unemployment in Keynes’s Labor Market,” *History of Political Economy* 1995.

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## Prehistory – Keynes: Labor Market – 2

- Defines unemployment not by aggregative version of individual situation: *real wage* > *marginal disutility of labor* but by market test:
 

“Men are involuntarily unemployed if, in the event of a small rise in the price of wage-goods relatively to the money-wage, both the aggregate supply of labour willing to work for the current money-wage and the aggregate demand for it at that wage would be greater than the existing volume of employment.”
- No reference to aggregate labor-supply function.

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## Keynes vs. Frisch – 1

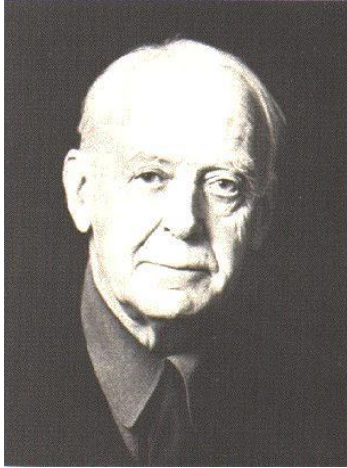
- Dynamics
  - Both: non-Walrasian
  
- Macro vs. micro
  - Both:
    - macro = system property
    - micro = isolated subsystem property

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## Keynes vs. Frisch – 2

- The Macro World View:
  - Frisch: macro system a giant machine approximated by coarser simplifications;
  - Keynes: macro properties emergent
  
- Aggregation and Econometrics
  - Frisch: aggregation pragmatically necessary for econometrics;
  - Keynes: against econometrics; despite introducing terms such as *aggregate supply* and *aggregate demand*, aggregates do not drive dynamics

## Prehistory – Hicks



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

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## Prehistory – Hicks: Aggregation – 1

- Unlike Frisch or Keynes, Hicks addresses aggregation: *composite-commodity theorem*:

*“if the prices of a group of goods change in the same proportion, that group of goods behaves just as if it were a single commodity.”*

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## Prehistory – Hicks: Aggregation – 2

### ■ Two responses:

1. aggregation practically impossible → the *general-equilibrium program of microfoundations* (see Weintraub)
2. aggregation possible in special cases → *aggregate general equilibrium program* → Patinkin, Clower, Barro & Grossman, Malivaud (see recent unpublished papers by Backhouse and Boianovsky)
  - not econometric;
  - not genetically related to representative-agent program.

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## Klein and the Aggregation Program



- Keynesian
- Walrasian
- Econometrician

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## Klein on the Nature of Macro

- Aggregation defines macroeconomics; solving aggregation is the problem of microfoundations:

*“A problem which has never been adequately considered by Keynesians is the derivation of a theory in terms of communities of individuals and groups of commodities from a basic theory in terms of individuals and single commodities. In modern economic terminology this is the problem of passing from micro to macro economics, i.e., aggregation.”*

The Keynesian Revolution (1947)

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## Klein:

### The Microfoundations of Aggregation – 1

- Hicks' composite-commodity theorem insufficient for econometrics
- Two approaches to microfoundations of aggregation:
  - accept available aggregates; derive behavior from microeconomic first principles; Klein rejects;
  - accept both micro theory and macroeconomic relationships; find aggregates that render them consistent – Klein accepts:
    - “we cannot know in advance the form of the aggregates but must accept those forms which satisfy a mathematical requirement.”
    - “[t]here is no reason to assume . . . that there is something sacred about a sum” (Klein 1946)

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## Klein:

### The Microfoundations of Aggregation – 2

- Aggregation theory as theoretical reassurance:

*“If we want to simplify mathematical models of general equilibrium into a small number of equations, it is useful to know that operationally significant concepts exist which justify such simplifications.”*

- Supporting a practical empirical enterprise:

*“It is only in models of macroeconomics that we can see through all the complex interrelationships of the economy in order to form intelligent judgments about such important magnitudes as aggregate employment, output, consumption, and investment.” (Klein 1946)*

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## Klein:

### The Microfoundations of Aggregation – 3

- History proves Klein overoptimistic:  
Sonnenschein-Debreu-Mantel result – special cases but no general method of aggregation
- Practical justification for working with available aggregates:
  - budget studies
  - high correlation between theoretically proper and conventional aggregates
  - pragmatic imperative (like Frisch)

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## Klein and the Macroeconometrics of the '50s – '70s – 1

- Top-down approach:

*“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

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## Klein and the Macroeconometrics of the '50s – '70s – 2

- Starting with small macromodels:

- Klein, *Economic Fluctuations in the United States, 1921-1941*. (1950)
- Klein and Arthur S. Goldberger. *An Econometric Model of the United States: 1929-1952*. (1955)

- Klein progressed to big ones:

Duesenberry, James S., Gary Fromm, Lawrence R. Klein, and Edwin Kuh, editors. *The Brookings Quarterly Econometric Model of the United States*. (1965)

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## The Brookings Model and Microfoundations

- > 150 equations
- Each equation given microanalysis
- Extensive disaggregation
- Tradeoff:
  - imprecision of aggregated relationships
  - low signal-to-noise ratio of disaggregated data

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## The Aggregation Program

- Aggregation program was the *empirical* microfoundational program of the 1950s through 1970s
- Example: Duesenberry and Friedman on consumption function
- Issue not deductive certainty but of apparent consistency
- Reasoning analogical

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## Origins of the Representative-Agent Program



- Key players:
- Edmund Phelps



- Robert Lucas, Jr.

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**Table 1**  
**Microfoundations and Individual Economists**

|                    | Barro<br>and<br>Grossman | Clower | Lucas | Phelps | Weintraub |
|--------------------|--------------------------|--------|-------|--------|-----------|
| Barro and Grossman | 214                      | 82     | 113   | 101    | 14        |
| Clower             | 82                       | 267    | 103   | 62     | 38        |
| Lucas              | 113                      | 103    | 652   | 303    | 33        |
| Phelps             | 101                      | 62     | 303   | 653    | 30        |
| Weintraub          | 14                       | 38     | 33    | 30     | 142       |

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## The Phelps Volume

- *Microeconomic Foundations of Employment and Inflation Theory* (1970)
- No sharp break
  - In Aggregation Program tradition
  - misunderstood Keynes: correcting Keynes's "esoteric non-neutrality"
  - "island model" – example of special case simplification *alá* Hicks
- Lucas and Rapping: first new classical paper

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## Early Lucas

- Slippage between special-case models (exact derivation possible) and *empirical* aggregate models:
  - "Expectations and the Neutrality of Money," *Journal of Economic Theory*, 1972
  - "Some International Evidence on Output-Inflation Tradeoffs," *American Economic Review*, 1973

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## Elements of the Representative-Agent Program – 1

- Rational expectation: a system property → general equilibrium
  - Early new classical models aggregate IS-LM
- Econometric program
  - Lucas and Sargent, editors, *Rational Expectations and Econometric Practice* (1981)
- Lucas critique (1976) → optimization by decision-making agents

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## Elements of the Representative-Agent Program – 2

- Eliminative microfoundations:

*If these developments succeed, the term "macroeconomics" will simply disappear from use, and the modifier "micro" will become superfluous. We will simply speak, as did Smith, Ricardo, Marshall, and Walras, of economic theory.*

Lucas 1987

- Technical limitations → representative-agents models

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## Representative-Agent Program: The Lure of Technique – 1

- *“The historical reason for modeling price dynamics as responses to static excess demands [as opposed to dynamic optimization with individual agents] goes no deeper than the observation that the theorists of that time did not know any other way to do it.”*
- *“The case for the use of competitive theory in modeling business cycles would . . . be based entirely on convenience, or on the limits imposed on us by available technology . . . ”*

Lucas 1980

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## Representative-Agent Program: The Lure of Technique – 2

- Technical rationale sound for special-case, theoretical analysis
- Ignores aggregation theory
- Source for representative-agent models optimal growth literature – ultimately Ramsey
- No relationship to Keynesian representative-agent models in Barro-Grossman tradition

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## Representative-Agent Program vs. Aggregation Program – 1

- Mainstream macro sleepwalked into representative agent model
- Virtue: exact derivability
- Klein: the data as the binding constraint
  - disaggregate as far as the data permit, looking for a general consistency with microeconomic theory.
- Lucas: theory as the binding constraint
  - work out the theory in a tractable special case and disaggregate as far as the technical advance of microeconomic theory permits, looking for a general, nearly impressionistic, consistency with the available data.

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## Representative-Agent Program vs. Aggregation Program – 2

- Klein: top down
- Lucas: bottom up
- Not quite symmetrical: Lucas elevates theory *selectively*
  - formal deduction from microeconomics elevated to highest value
  - ignores *microeconomic* aggregation theory (Sonnenschein-Debreu-Mantel theorem) that undermines general claims of empirical representative-agent models

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*Thanks*

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*The End*