

Asset Prices, Market Selection and Belief Heterogeneity

Introduction

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THE QUESTIONS

- Standard Microeconomics and GE make obviously false assumptions about individuals and firms:
 - ① (Expected) Utility and profit maximisation.
 - ② Rational expectations.
 - ③ Time separability, exponential discounting, neutrality towards ambiguity, etc.
- Are there individual-level or aggregate-level forces that make competitive markets to look as if they were populated by agents like the ones assume in standard micro and GE?
 - Individual-level forces: adaptive behaviour
 - ① Learning
 - ② Imitation
 - Aggregate-level forces: selection
 - ① Wealth dynamics
 - ② Biological reproduction

WHY DOES IT MATTER?

- The role of a good model is

“... to make correct predictions about the consequences of any change in circumstances. Its performance is to be judged by the precision, scope and conformity with exercise of the predictions it yields.”

Milton Friedman, 1953.

- Friedman seems to suggest that only positive economics matters as you cannot do welfare economics if you make wrong assumptions regarding agents' welfare.
 - If you believe in doing only positive economics, then why bother with micro-foundations? GE passes Friedman test as it does not have many testable implications.
 - Besides, most of the GE predictions come from implications of individual behaviour such as no-arbitrage.
- Explicitly modelling learning and market selection helps to make better positive economics as well !!

OBJECTIVES

- We will focus on asset pricing but similar analysis can be applied to other topics like the behaviour of firms in markets or games.
- The role of learning and market selection to provide foundations for the assumptions made in standard micro and GE treatment of competitive asset pricing.
- To understand when these forces can help to improve the positive predictions of asset pricing models.

ADAPTATION AND SELECTION

- Adaptation: learning, imitation and boundedly rational behaviour rules involving search and experimentation.
- Selection: the Chicago idea that competition for scarce resources favours some behaviours over others.
 - Rational Investors drive out irrational investors and, therefore, determine asset prices.
 - Profit maximising firms drive others (sales or revenue oriented, for example) out of the market and determine prices and market shares.

MARKET SELECTION

- *“Given the uncertainty of the real world, the many actual and virtual traders will have many, perhaps equally many, forecasts. . . . If any group of traders was consistently better than average in forecasting stock prices, they would accumulate wealth and give their forecasts greater and greater weight. In this process, they would bring the present price closer to the true value.”*

Cootner, 1967

- *“. . . dependence in the noise generating process would tend to produce bubbles in the price series. . . . If there are many sophisticated traders in the market, however, they will be able to recognize situations where the price of a common stock is beginning to run up above its intrinsic value. If there are enough of these sophisticated traders, they may tend to prevent these bubbles from ever occurring.”*

“A superior analyst is one whose gains over many periods of time are consistently greater than those of the market.”

Fama, 1965

THE APPROPRIATE ENVIRONMENT

- For adaptation to work one needs repeated choice and large number of individuals.
- For selection to work one needs repeated choices of an scarce resource that flows from one agent to another.
- Financial markets seems to be a natural set up for both forces to flourish.

THE DIFFICULTIES

- Market selection is not obvious as it operates through wealth dynamics but wealth accumulation is not always the same as utility maximisation.
- Even if selection occurs, convergence may not occur.

OUTLINE

- Preliminaries
 - 1 Review some basic optimisation results on infinite dimensional spaces.
 - 2 Expected Utility and Bayesian Updating.
 - 3 Bayesian Learning: Convergence and Consistency.

- Standard models of asset pricing.
 - 1 Arrow-Debreu Markets.
 - 2 Sequentially Complete Markets:
 - Homogeneous Correct Beliefs (Rational Expectations).
 - Homogeneous Incorrect Beliefs: learning.
 - Heterogeneous Beliefs: learning and market selection.

 - 3 Sequentially Incomplete Markets:
 - Homogeneous Correct Beliefs (Rational Expectations).
 - Heterogeneous Beliefs: learning and market selection.