Finance 6470 - Derivatives Markets

Christopher Culp - Economic Theory and Equilibrium

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Epigraph

"There are basically two kinds of philosophy: prickles and goo. Prickly people are precise and logical - they like everything chopped up and clear. On the other hand, goo people like it vague. In physics, prickly people are those who believe that the ultimate constituency of matter is particles, whereas goo people believe in waves. In philosophy, prickly people are logical positivists, and goo people are idealists. And they're always arguing with each other. But neither could take a position without the other perosn, because you wouldn't know that you advocated prickles unless there were someone out there advocating goo. You can't know a prickle without the goo. And life is neither prickles nor goo - it's gooey prickles and prickly goo." – Alan Watts (Out of Your Mind pp. 17-18)

Introduction

- "One of the most important concepts in both economics and finance is the notion of *equilibrium*"
- It may surprise you to discover that there is not universally agreed upon definition of equilibrium.
  - We will be discussing several different views of equilibrium
- Invoking an equilibrium concept is the way that ***most*** economic models operate. So understanding the basic ideas are crucial.

The Relevance of Economic Theory

- The economist Lionel Robbins wrote *"the science which studies human behavior as a relationship between ends and scarce means which have alternative uses"* (Robbins, 1932, p. 16)
- This is the basic idea of neoclassical equilibrium, at least as painted with *very* broad brush strokes
- Hayek and Buchanan take issue with this definition
  - Hayek proposed a definition of equilibrium as the coordination of individual plans
  - Buchanan proposed that economists study ***catallactics*** or ***symbiotics***
  - These two views are practically the same, but Buchanan fills in some of the details about what Hayek meant (we are very grateful for that)
  - The basic view takes into account the dynamic nature of the market and conceives of it fundamentally as a ***process***
  - Buchanan felt so strongly that he proposed that he might not be an ***economist*** (he meant that if Robbins's definition is accepted, then he was not that)

Culp's Take

- *"But at the day-to-day level of corporate decision making, economic theory has been so marginalized that it is viewed as being largely irrelevant."*
- *"**Everyone** outside the economic profession has probably at one time or another regarded economists as overly theoretical and abstract creatures disconnected from the operations of 'the real world.' "*
- The main reason:
  - *"... a self-inflicted wound for which economists have only themselves to blame."*
  - *"scholarly economics journals and studies have over the years become increasingly reliant on highly mathematical and technical modeling approaches."*
  - *"Paradoxically, the better the economist by most current metrics of the profession, the less likely it is that an average person with a B.A. from a liberal arts school will be able to digest what they say and write."*

My Take

- Culp doesn't quite convince me that this is why. He's warm though.
- If the highly mathematical models were predictive, then firms would gladly hire talent that can understand and implement them.
- Look at the role of ***quants*** on Wall Street. This suggests that finance models have some empirical and predictive content.
  - Wall Street hires more physicists than all other hiring sources combined!
  - Q: What is the world market for DSGE models outside of academia and government?!
- Also see what is happening around ***Data Science*** right now. A PhD in statistics, computer science or electrical engineering is a hot ticket!

Relevance Continued

- The classical economists were not marginalized, but rather were seen as quite important members of society!
- *"Historically, economics was neither a science nor a subject aimed primarily at the intellectual."*
- *"A second reason for the marginalization of economic theory today must surely be the widespread perception [of] its general failure as a science."*
  - Ouch! Harsh! But true?

Physics vs Economics

"An example will suffice to illustrate the point. In physics, the law of gravity says that when an apple becomes detached from the tree, it will fall to the ground. No matter how much data you collect, this will be true 100 percent of the time. In economics, the criteria for determining 'success' of models are much laxer. The law of demand, for example, states that the price someone is willing to pay for a good is inversely proportional to the quantity demanded - that is 'demand curves' slope down."

Schools of Economic Thought And Characterizations of Equilibrium

- Economics began with Adam Smith's publication of *The Wealth of Nations*
- It is notable that Smith was a ***moral philosopher*** and not a mathematician or a physical scientist

Classical Period

- Smith's WON was published in 1776 (a good year for very important documents)
- Classical economists:
  - Adam Smith (a moral philosopher)
  - David Ricardo (member of parliament)
  - Karl Marx (journalist and revolutionary)
  - John Stuart Mill (philosopher)
  - Thomas Malthus (member of parliament)
- Labor theory of value
- Belief that most things in the economy tended towards some *natural rate*
- *"The tendency of supply shifts to cause a convergence between market and natural rates is essentially the Classical or Ricardian definition of an equilibrium."*

The Marginalist Revolution and the Neoclassical Period

- The birth of the neoclassical period is credited to William Stanley Jevons and Leon Walras
  - Jevons: LOOP
  - Walras: father of mathematical method in economics. Simultaneous equations for supply and demand. Auctioneer who clears markets.
- Carl Menger was also a key figure (would become the father of the Austrian school)
  - Harshly criticized Marx's labor theory of value
  - Originated the concept of subjective value
- Jevons, Walras and Menger originated the **"marginal revolution"**
  - Market value of goods and factors of production were determined "at the margin" between the forces of supply and demand
  - Intro Micro: $MR = MC$

The Marginal Revolution Continued

- Jevon's LOOP
  - *"identical goods of uniform quality must sell for the same price."*
- Walras
  - *"Walras argued that the market price of a good was the price at which supply and demand curves intersected."*
  - One of the first to discuss the concept of *marginal utility*
  - *"What Walras did not do, however, was contemplate any realist adjustment mechanism by which the market forces of supply and demand were reconciled. . . . Instead, Walras merely supposed the existence of an auctioneer who literally called out prices."*

The Marginal Revolution Continued

- Edgeworth refined Walrasian equilibrium by introducing the possibility of *recontracting*.
  - *"Economic agents would simple amend their prior price agreements"*
- Marshall: developed the concepts of *short run* and *long run*
- *"Only imperfect competition can explain positive long-run profits in a Marshallian equilibrium."*

Summary of The Neoclassical School

The basic tenets of the neoclassical school include the following:

- The law of one price
- The distinctions between short-run and long-run behavior of market participants and markets
- The inability of firms to earn positive economic profits in the long run in a perfectly competitive market
- Returns to scale in production; nonsatiation and diminishing marginal utility in consumption
- Market efficiency
- Equilibrium is seen as a balance of forces
- Nothing interesting about *disequilibrium*, since it is seen as a momentary state that cannot persist

Menger and the Austrian Critique

- The so-called ***"Austrian School"*** gets its name from the fact that Menger was an Austrian
  - Curious fact: there are not current "Austrian" economists living in Austria
- *"The Austrian school was quickly marginalized"*
- Capital theory of Bohm-Bawerk (1891) and Lachmann (1978)
- Nobelists F.A. Hayek and Sir John Hicks (who also accepted by neoclassicals)

Menger Continued

- *"Menger (1871) deserves probably as much credit as Walras (1874) for recognizing the role of marginal utility in governing consumption optimality. But unlike Walras and other neoclassicals, Menger (1871) advanced the theory of* ***subjective value****, which held that each individual's values and utilities were subjective, relative, dependent on the psychology and wants of that particular individual, and - imporantly - not directly comparable across different economic agents."*
- Noeclassical economics tends to stress objective and knowable quantities
- Austrian economics tends to stress subjective and unknowable quanities

Menger Continued

- *"The neoclassical theory of equilibrium essentially postulates an equilibrium as a balance of forces - supply and demand - that lead to either a state of rest or a steady state of uniform motion in a system."*
- *"In the Austrian theory, equilibrium can be better defined as a situation in which knowledge and expectations lead to consistent plans. Hayek (1937) defines and equilibrium as a situation in which 'the different plans which the individuals composing [an economic system] have made for action in time are mutually compatible.' To Austrians, equilibrium thus is more of a **tendency** than a stationary or steady state."*
- *"... perhaps the richest insights from the Austrian school thus are not its analyses of equilibrium, but rather its analysis of **disequilibrium**."*

Menger Continued

- *"In the Austrian paradigm, disequilibrium is basically the constant state of affairs. Markets still **tend** toward equilibrium, but the constant changes in information, knowledge, and expectations of individuals make the market much more of a **process** than a state of nature."*
- What if the Austrians were right? That would mean there is no Marshallian long-run state towards which the market is inevitably moving. This would imply that some form of stable situation exists in which profits are possible and information is not equal across market participants.
- I should - here as elsewhere - acknowledge my heresy to be honest in advertising

Hick's Neo-Austrian Middle Ground

- Sir John Hicks called himself a ***neo-Austrian***
- Hicks adopted Hayek's notion of equilibrium as a consistency in plans (in most of his work)
- He fundamentally disagreed with Marshall about a clean separation between short and long run.
- He embraced these Austrian concepts without giving up the standard tools of formal economic analysis (pioneered by Jevons and Walras)

Neo-Austrian Continued

- In this class we essentially retain the core features of the neoclassical paradigm (LOOP, marginalism, rising supply price, etc)
- ***But*** we remain openly sympathetic to the Austrian critique and to the view of the market as a process, equilibrium as a consistency of plans
- *"it becomes quite hard to explain a lot of financial and derivatives market activity without being **a little bit Austrian**"*