Sequential Market Treatment

Perfect Foresight

Perfect foresight is the ability to predict equilibrium prices in all future contingencies.

- Radner (1972) proves existence of Perfect Foresight Equilibrium for multi-asset economies with sequential trade.
- Kreps (1972) and Duffie and Huang (1985) demonstrate (conditional) price equivalence to Arrow-Debreu equilibrium under myopia.

Intuition & Relevance

Consider the following scenario:

- Tomorrow, either the sun shines or it rains.
- You may (or may not) know the chances.
- Perfect foresight requires you to know the equilibrium prices of, say, ice cream in either case (how?!!)

Perfect foresight is of fundamental importance for:

- Corporate finance: absence of arbitrage as in, e.g., Modigliani and Miller (1958).
- Derivatives: option pricing à la Black and Scholes (1973).
- Investments: any multi-period investment problem.

Important Distinction

1. Note, perfect foresight does not imply perfect foresight of the future (i.e., allows for uncertainty!)
2. The concept of “perfection” is core to game theory (subgame perfect Nash equilibrium).

Implications of Perfect Foresight

- There is only one source of uncertainty (e.g., sunshine vs. rain).
- Given the state, there is no price uncertainty.
- Hence, risk premia only depend on fundamental risk (e.g., the weather).

Under perfect foresight, standard theory fails to reconcile the sizable equity premium with historically low consumption risk.

Perfect Foresight vs. Myopia

Is Perfect Foresight Realistic?

- Clearly, perfect foresight imposes very demanding level of rationality.
- We propose a more realistic (?) alternative:

Myopia

- Do not even try to forecast future prices.
- Only take into account what you do know:
  1. How much of any given asset do you own (without trading) in every contingency.
  2. What is traded today and at what prices.

Remarks:

- Under myopia, everything is as in the standard theory, except that one ignores future (re-)trading opportunities.
- No need to forecast prices.
- Related to narrow framing (Barberis et al., 2006), but less extreme.
- Under narrow framing, one ignores any holdings in non-traded assets.
- Different to “myopia” in dynamic investments under log utility.

Summary

You will trade “tokens” (wood, steel, and plastic) in an online market with other participants. The goal is to collect tokens which will let you produce Widgets. You should try to produce as many Widgets as possible because your earnings will depend on it. You will have access to a spreadsheet which will tell you how many Widgets you can get for a given token, the number of widgets you can get for a given token, the number of widgets you can get for a given token.

Plastic is a special input because it can be used to replace wood or steel in the production of Widgets.

Steel can be traded for plastic in the wood market and wood can be traded for plastic in the wood market. You cannot trade steel and wood one-on-one directly, but you can trade wood and steel together. So, plastic acts as “cash”, and we will often refer to it as cash.

This game will be repeated several times, switching between situations where you can simultaneously trade in the steel and wood markets, and situations where you must first trade in the steel market and then in the wood market.

Instructions

Initial Holdings

<table>
<thead>
<tr>
<th>Asset</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>5</td>
</tr>
<tr>
<td>Steel</td>
<td>8</td>
</tr>
<tr>
<td>Wood</td>
<td>0</td>
</tr>
</tbody>
</table>

Performance: $4.35

Possible Future Trades

<table>
<thead>
<tr>
<th>Buy Asset</th>
<th>Quantity</th>
<th>Price (Plastic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Wood</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sell Asset</th>
<th>Quantity</th>
<th>Price (Plastic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
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<td>5</td>
</tr>
<tr>
<td>Wood</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Performance: $4.35

Post-Trade Holdings

<table>
<thead>
<tr>
<th>Asset</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>5</td>
</tr>
<tr>
<td>Steel</td>
<td>8</td>
</tr>
<tr>
<td>Wood</td>
<td>0</td>
</tr>
</tbody>
</table>

Performance: $4.35

Perfect change: $0.00

Multi-Market Trading Interface

Screenshot of Experimental Software

Google Spreadsheet

References