Price discovery in RIT market PD0

Symmetric private information

- Private: Different groups of traders have different information.
- Symmetric: everyone’s information is of the same quality.
- Price discovery
  - The trading process that eventually arrives at a new consensus price.
- In PD0, nobody has perfect information about the security value.
The information structure

- The true value of the stock is $V \in \{20, 22, 24, 26, 28\}$, with equal $\left(\frac{1}{5}\right)$ probability.
- Your information will come in the form of three values that are ruled out.
- Different groups of traders will know different ruled-out values.

Example

- Suppose that you’re in group $I$ and ...
  - After one minute, you know $V \in \{20, 22, 24, 26, 28\}$
  - After two minutes, you know $V \in \{20, 22, 24, 26, 28\}$
  - After three minutes, you know $V \in \{20, 22, 24, 26, 28\}$
  - The remaining possibilities are $V \in \{24, 28\}$
- Another group, say Group $II$, might know at this point that $V \in \{20, 24\}$.
- Group $III$ might know that $V \in \{26, 24\}$
- Everyone’s information contains the true value (24, in this case) and on other “possible”.
Analysis: at what price should the stock be trading?

- Initially, when $V \in \{20, 22, 24, 26, 28\}$,
  
  $$EV = \frac{(20 + 22 + 24 + 26 + 28)}{5} = 24$$

- If you know $V \in \{20, 22, 24, 26, 28\}$,
  
  $$EV = \frac{(20 + 22 + 24 + 28)}{4} = 23.5$$

- If you know $V \in \{20, 22, 24, 26, 28\}$,
  
  $$EV = \frac{(22 + 24 + 28)}{3} = 24.7$$