Dubey, Geanakoplos, Shubik

— People infer information from prices before deciding consumption
— Prices contain information that consumers transmit through demand

Here, in each period,

private information $\longrightarrow$ individual action $\longrightarrow$ prices $\longrightarrow$ public information $\longrightarrow$

continuum of agents, so each agent is small except possibly in terms of their information.

<u>Results</u>

1) Charting past prices does not help — all previous information is revealed
2) better information does lead to profits
3) people have incentives to gather information

$\boxed{\text{REE}}$

S finite set of states

$n \in N$ set of agents

I^n information partition of S

all information $I^* = \bigvee_{n \in N} I^n$

$\mathbb{R}_+^{L \times S}$ contingent commodity space

$x^n : S \to \mathbb{R}_+^L$ allocation function utility $\quad u^n : \mathbb{R}_+^{L\times S} \to \mathbb{R}$ $\quad$ concave, monotonic

endowments $\quad e^n \in \mathbb{R}_+^{L\times S}$ $\quad$ measurable w.r.t. I^n

<u>Price function</u> $\quad p : S \to \mathbb{R}_+^L$ $\quad$ invertible

$$I^n \vee I(p)$$

$\boxed{\text{NE}}$ Now two time periods

$$e^n, \tilde{e}^n$$

$$u^n : \mathbb{R}_+^{L\times S} \times \mathbb{R}_+^{L\times S} \longrightarrow \mathbb{R}$$

In each period, put up quantities of goods for sale. In period 2, know first period prices.

$$z^n = (b_1^n, \cdots b_{L-1}^n, q_1^n \cdots q_{L-1}^n)$$

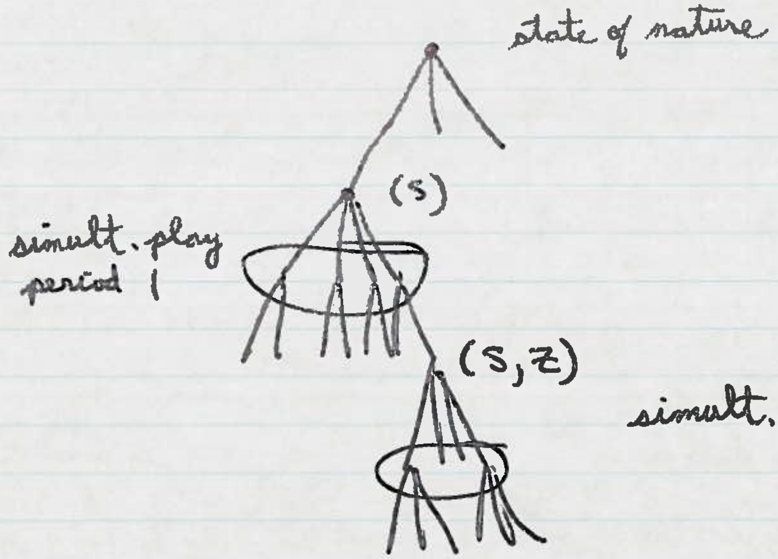
L^{th} good is a commodity money

budget

<u>price</u> $\quad p_i = \dfrac{\sum_n b_i^n}{\sum_n q_i^n}$

<u>net trades</u> $\quad Y_i^n = \dfrac{b_i^n}{p_i} - q_i^n$ $\quad$ (no storage)

$$Y_L^n = \sum_{i=1}^{L-1} q_i^n p_i - \sum_{i=1}^{L-1} b_i^n$$



simult. choose $\tilde{z}$, given $\tilde{I}^n$

Solution is NE

Results :

1) indiv. rational
2) non atomic case, generically NE exist, and first period prices are fully revealing
3) higher utilities for better informed agents

4) if N is finite then prices don't reveal everything
5) No mechanism implements REE for all economies.

ex. p20

ex.

$$u^i = \tfrac{1}{2}\left(A \log X_1^i + w_1^i + B \log \tilde{X}_1^i + \tilde{w}_1^i \right)$$
$$+ \tfrac{1}{2}\left(w_2^i + \tilde{w}_2^i \right)$$

X_1^i consumption in state 1
w_1^i money consumption state 1
w_2^i money consumption, state 2

tilda refers to period 2

type $i = 1,2$

$(0, 1]$ type 1
$(1, 2]$ type 2
$(2, 3]$ type 3

Commodity has no value in state 2

Type 3 traders are endowed with 20 units of the good, but only have utility for money.

Types 1 & 2 have endowments $(0, M)$ in each period

Type 1 sees the state, bid b_1 and b_2 in period 1
Type 2 is uninformed, bid b in period 1

In equil, no trader can influence price or second period payoff. Therefore, maximize first period payoff.

$b_2 = 0$

informed

$$\max_{b_1}: \quad \tfrac{1}{2}\left(A \log \frac{b_1}{p_1} + M - b_1\right) + \tfrac{1}{2} M$$

$$\frac{A}{2}\frac{1}{b_1} - \frac{1}{2} = 0$$

$$\boxed{b_1 = A}$$

uninformed

$$\max: \quad \tfrac{1}{2}\left(A \log \frac{b}{p_1} + M - b\right) + \tfrac{1}{2}(M - b)$$

$$\frac{A}{2b} - \frac{1}{2} - \frac{1}{2} = 0$$

$$\boxed{b = A/2}$$

$$\boxed{p_1 = \frac{3A}{40} \qquad p_2 = \frac{A}{40}}$$

suppose: $A = B = 10 \implies b_1 = 10 \quad b = 5 \quad p_1 = 3/4 \quad p_2 = 1/4$

$$X_1^I = 13\tfrac{1}{3} \qquad X_1^u = 6\tfrac{2}{3} \qquad X_2^u = 20$$

$$\pi^I = 5 \log 13\tfrac{1}{3} - 5 + M$$

$$\pi^u = 5 \log 6\tfrac{2}{3} - 5 + M$$

Period 2 both are informed

$$\tilde{b}_2 = 0, \quad \tilde{b}_1 = 10 \qquad p_1 = 1 \qquad p_2 = 0$$

$$\tilde{\pi}^I = \tilde{\pi}^u = 5 \log 10 - 5 + M$$

(Thm 2 p. 35)

UNInformed submit demand functions:

$$(\hat{p}' \quad \hat{q}')$$

$$(\hat{p}'' \quad \hat{q}'')$$

If informed only submit functions based on the true state, then we have the R.E.E.

If they submit functions that the uninformed submit, then any price clears the market.

$\therefore$ This mechanism does not implement the R.E.E.

Smoothness assumptions on $\tilde{\Sigma}$ All Actions $\xrightarrow{\Pi}$ Prices

$\Sigma \times$ Prices $\xrightarrow{\Phi}$ Net trade