# Notation

private value : $v$

bid : $b$

$f: v \to b$

payment : $p$

$M=(a, p)$

$a$: 分配　$p$: 支付

| | I | II | III | A | B |
|---|---|---|---|---|---|
| | $v_I$ | $v_{II}$ | $v_{III}$ | — | — |
| | 5 | 3 | 1 | | |

GFP

GSP　SP　I　II

IC { DSIC (不用猜別人)
　　BIC (猜人, 信念)

$VCG_{P_I} = (3+1) - (5+3-5)$

$= 4 - 3$

$= 1$

夠後

IC, IR } truthful

$u_I(v_I; (v_I, b_{-I})) \geq u_I'(v_I; (v_I', b_{-I}))$

$u_I(v_I; (b_I, b_{-I})) \geq 0$

utility

profit

$u_I = v - p$

$u_I^{GSP} = 5 - 3 = 2$

$u_I^{GFP} = 5 - 5 = 0$

$u_I^{VCG} = 5 - 1 = 4$

regret

$$rgt_i = \max_{v_i' \in V_i} u_i^w(v_i; (v_i', v_{-i})) - u_i^w(v_i; (v_i, v_{-i}))$$

$$\min_{w \in \mathbb{R}^d} \mathbb{E}_{v \sim Z}\left[-\sum_{i \in N} p_i^w(v)\right] + \alpha \cdot rgt_i(w) + \frac{\beta}{2} rgt_i^2(w)$$

$$s.t.\ rgt_i(w) = 0,\ \forall i \in N$$

$$\max \mathbb{E}\left[\sum p^w(v)\right]$$

$\Rightarrow$ 收益

附页

$$V = \hat{\prod_{i=1}} V_i$$

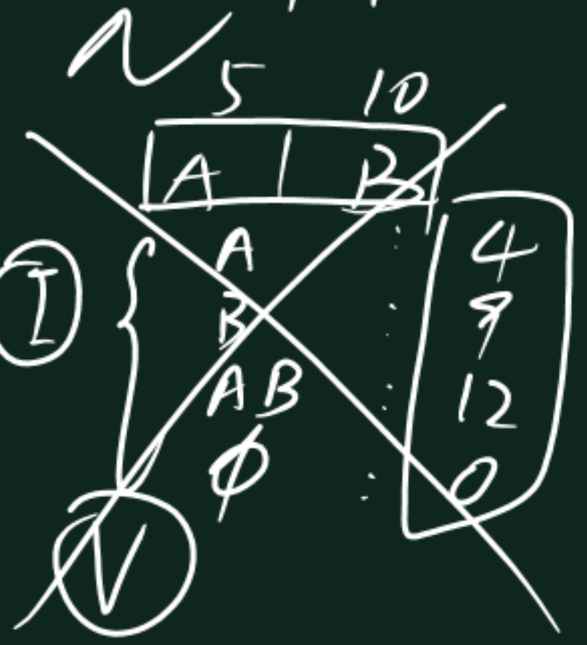
$V_i : 2^M \to R_{\geq 0}$

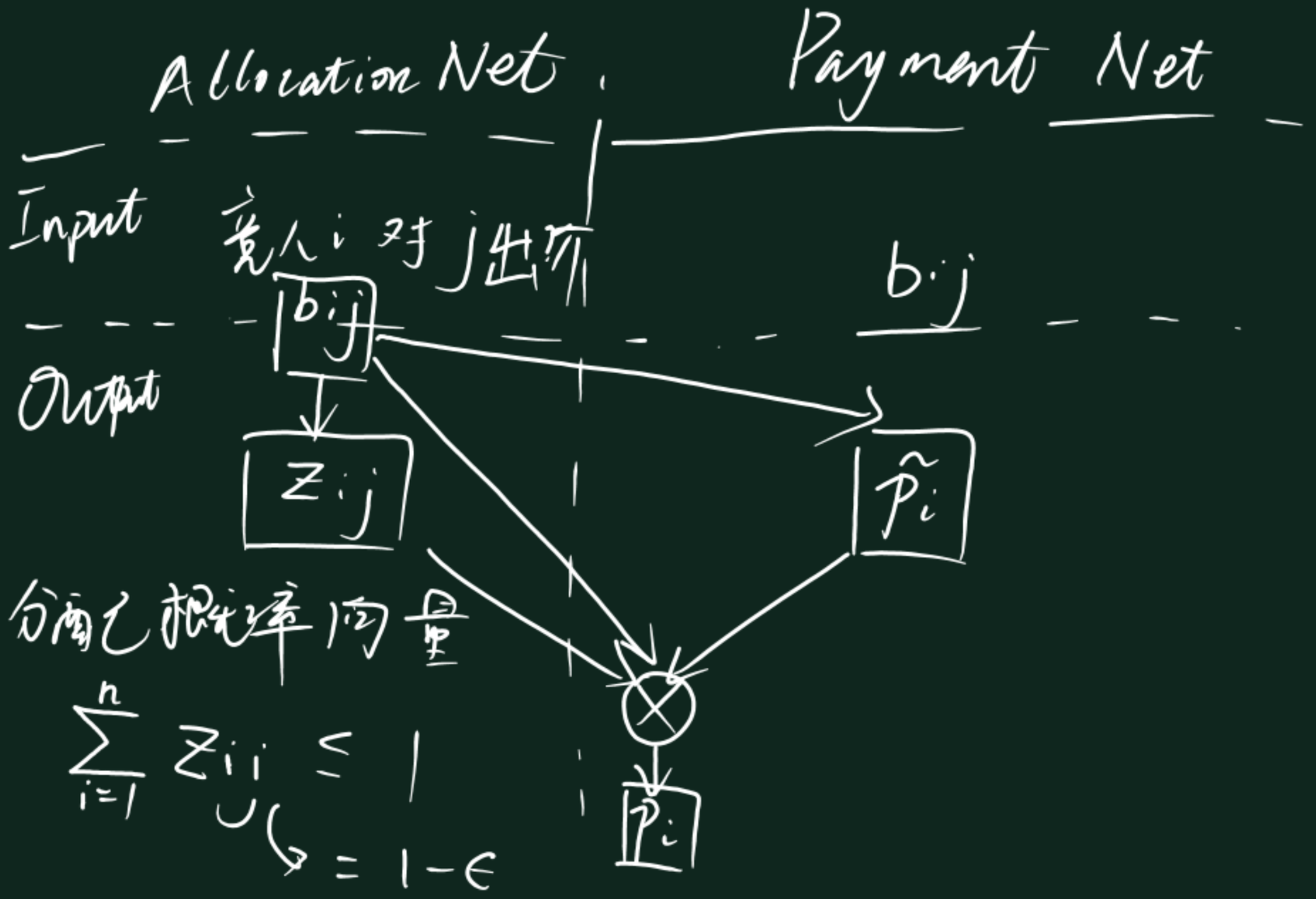
$V = [0,1] \times [0,1] \times \cdots \times [0,1]$

1 2

$V \sim F$

$F_i :$





Allocation Net
Payment Net
Input
竞人i对j出价
b·j
Output
b·j
z·j
$\tilde{p}_i$
分配比概率向量
$\sum_{i=1}^{n} z_{ij} \leq 1$
$= 1-\epsilon$
$p_i$

M_Net

R_Net