

HW3

Q, Gini index $k=2$ p $1-p$
HW

$$\Phi(p) = \sum p_k (1-p_k) = 2p(1-p)$$

$$\operatorname{argmax}_{p_1, \dots, p_k} \Phi(p_1, \dots, p_k) = \sum p_k (1-p_k) \quad \text{s.t. } \underline{\sum p_k = 1}$$

$$\operatorname{argmax}_{p_1, \dots, p_k, \lambda} \frac{\Phi(p_1, \dots, p_k) - \lambda (\sum p_k - 1)}{G}$$

$$\left\{ \begin{array}{l} \frac{\partial G}{\partial \lambda} = \sum p_k - 1 \stackrel{\text{set}}{=} 0 \\ \frac{\partial G}{\partial p_k} = \dots \end{array} \right\} \Rightarrow \left\{ \begin{array}{l} p_1 = \\ p_2 = \\ \vdots = \\ p_k = \end{array} \right.$$