EFFICIENCY, EQUITY, AND NEED

EE 474 Health Economics

Semester 2/2021

Topics

- Pareto Efficiency* and Competitive Markets
- Deviation from Competitive Model in the Health Care Sector
- Economic Efficiency Rationale for Social Health Insurance
- Need and Need-Based Distributions
- Horizontal Equity and Need

\ public finance
app. in tax.

Pareto Efficiency

- Recall the 4 basic questions from the first lecture:

what
1. What combination of health care and other goods and services should be produced?
2. What specific health care goods and services should be produced?

how
3. What specific health care resources should we use to produce the chosen health care goods and services?

For whom
4. Who should receive the health care goods and services that are produced?

- This lecture will address the last question.
  - How to distribute health care goods and services across consumers.

Goals : Efficiency & equity

Pareto Efficiency (Optimality)

- According to Vilfredo Pareto, an economically efficient (optimal) outcome in society is one under which it is impossible to make any person better off without hurting someone else.
- A Pareto improvement results from a exchange that helps someone without hurting another.
- These concepts can be applied to production by firms, but we will limit our discussion a pure exchange economy and the distribution of commodities among consumers.
- Pareto efficiency and Pareto improvement can be illustrated with an Edgeworth box.

* If there is Pareto improvement, it is NOT Pareto efficient.

Ex. Pareto efficiency.

Mr. A → online $\succ$ onsite

Mr. B → onsite $\sim$ online.

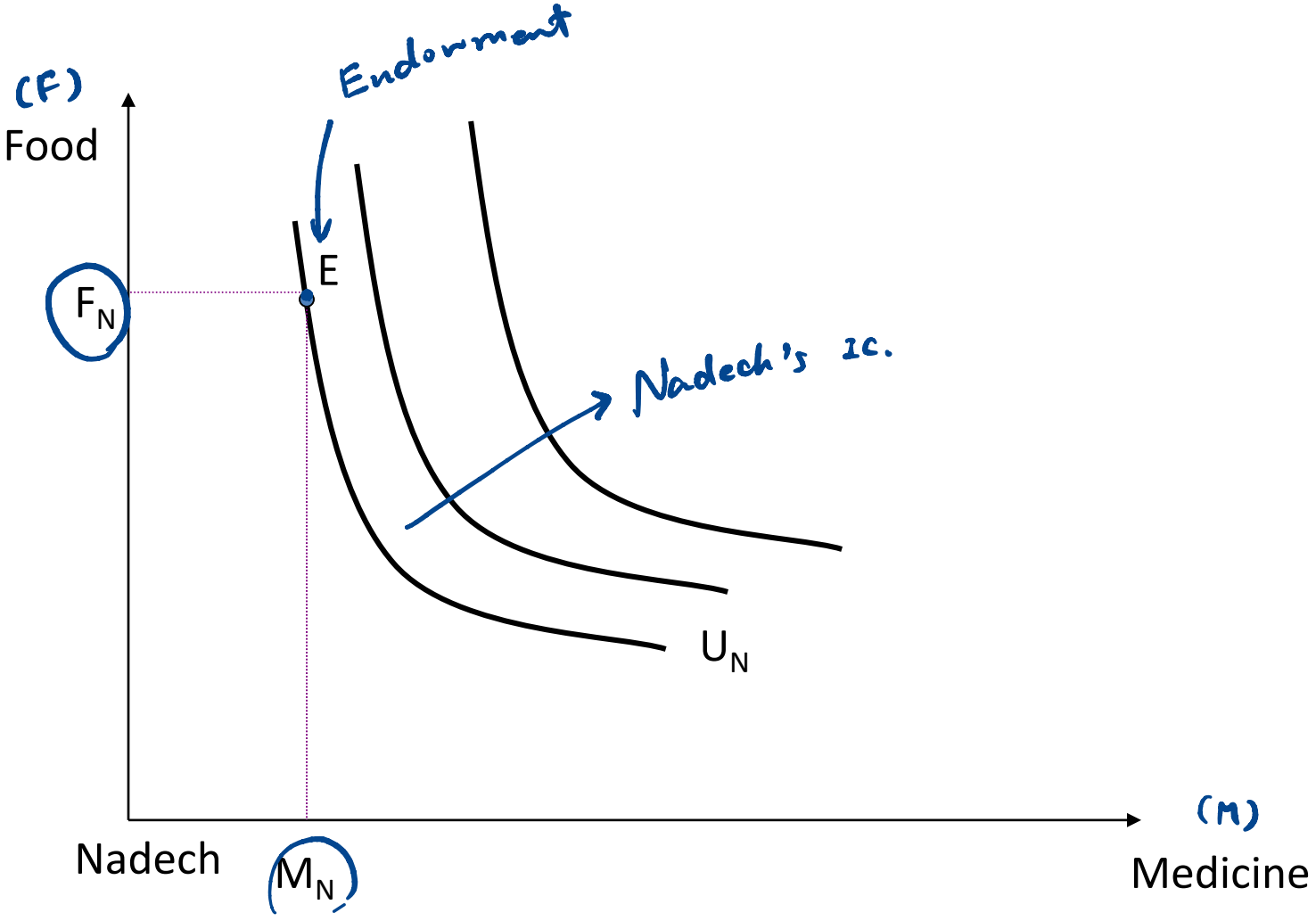
Choice : online → A is happy.
B is indifferent.

- Is "online" a Pareto efficient solution?
  Yes!
- Is there Pareto improvement if we choose online? → No!

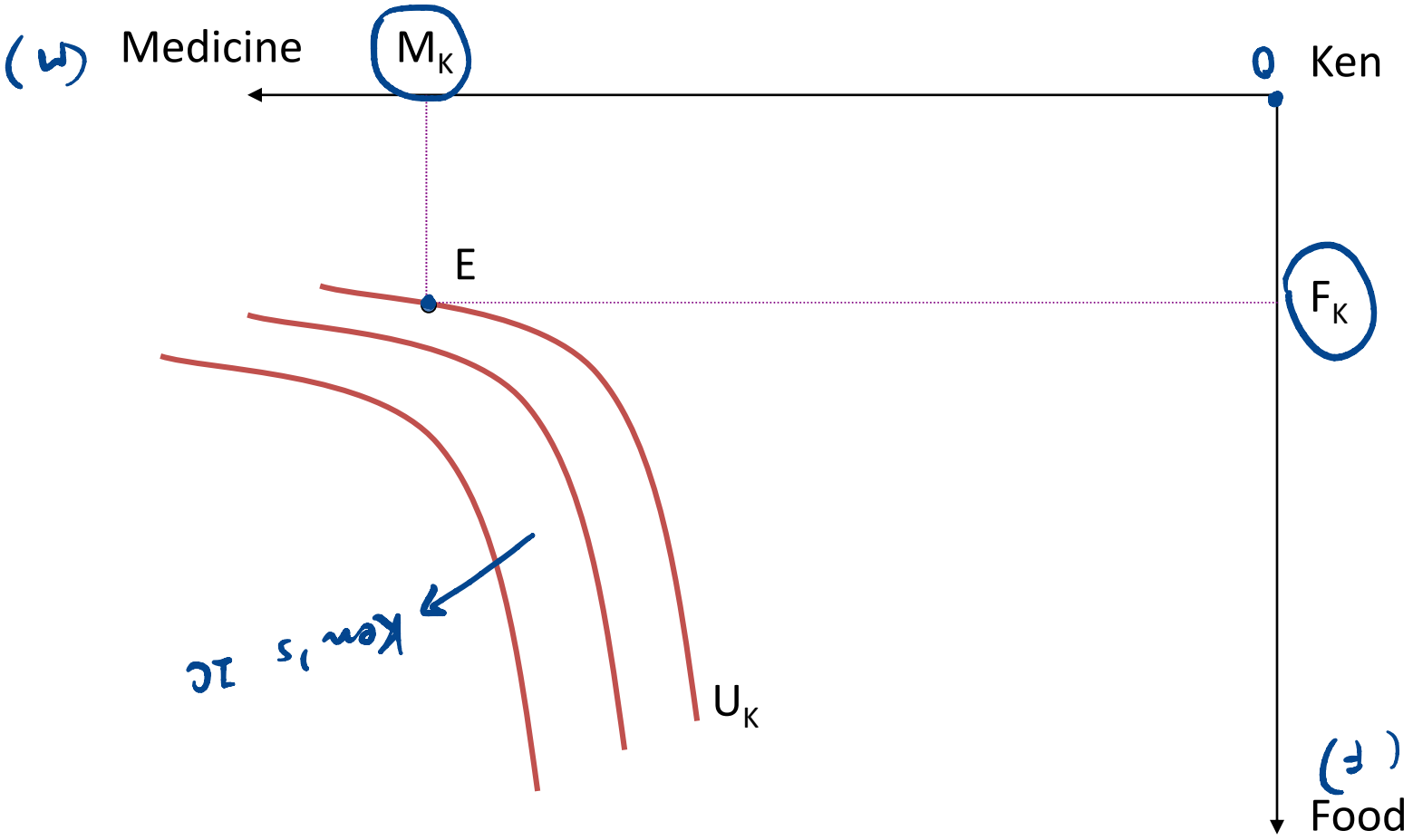
- Is there Pareto improvement if we choose onsite? → Yes!

Nadech's Indifference Curve for Food and Medicine

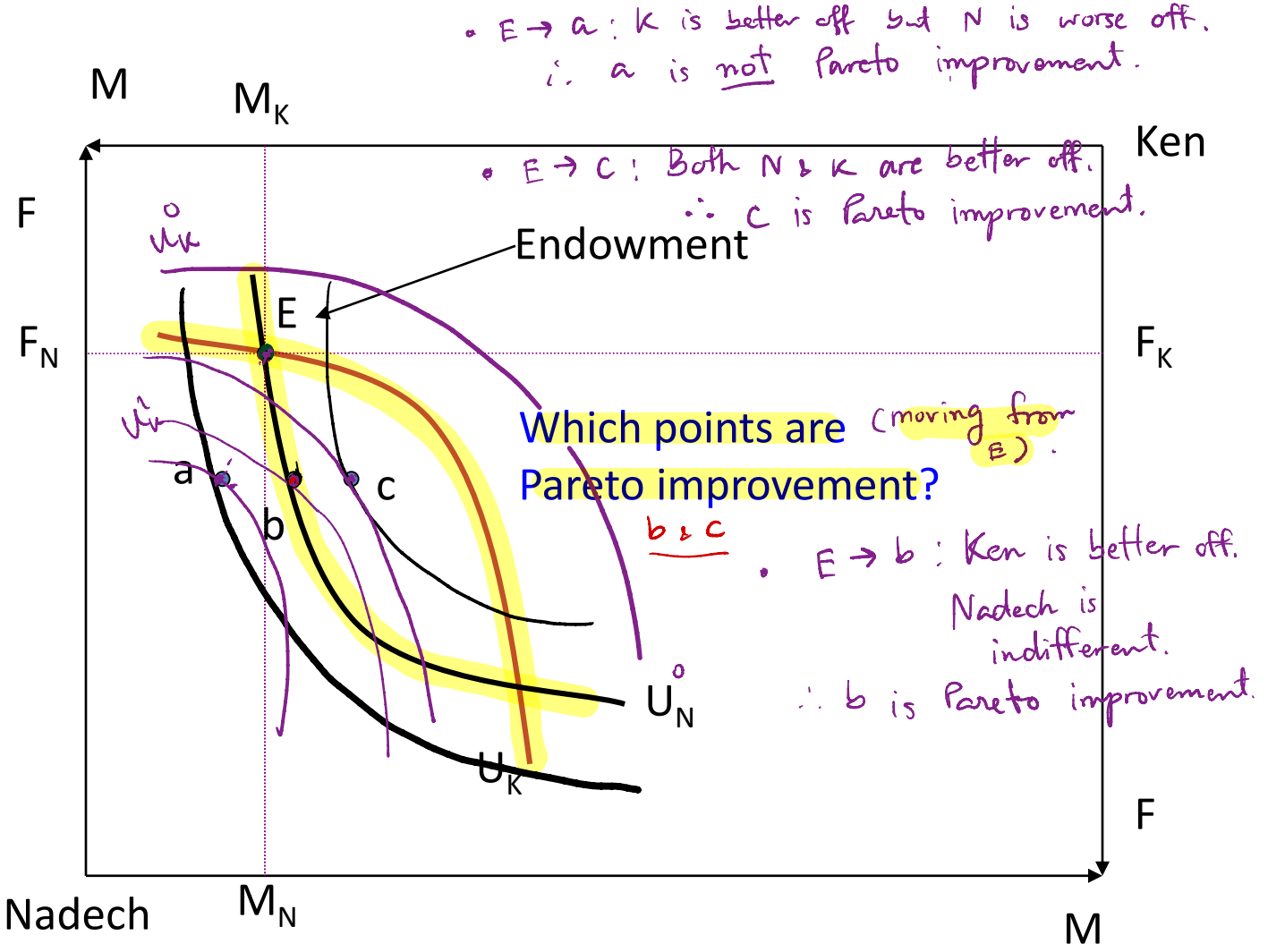
$U_N = U_N(M, F)$



Ken' indifference curve for Food and Medicine

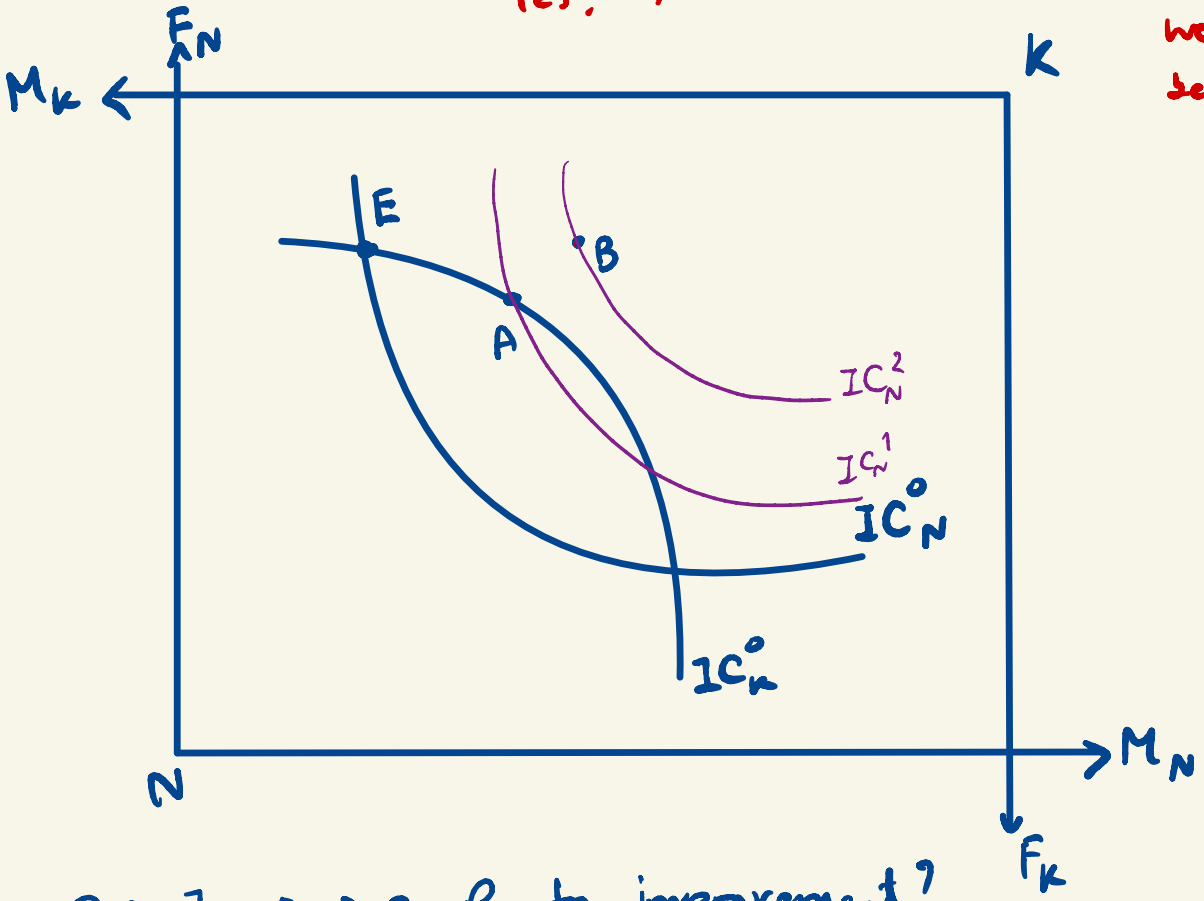


Edgeworth Box and Pareto Improvement



Q: Is E → A Pareto improvement?

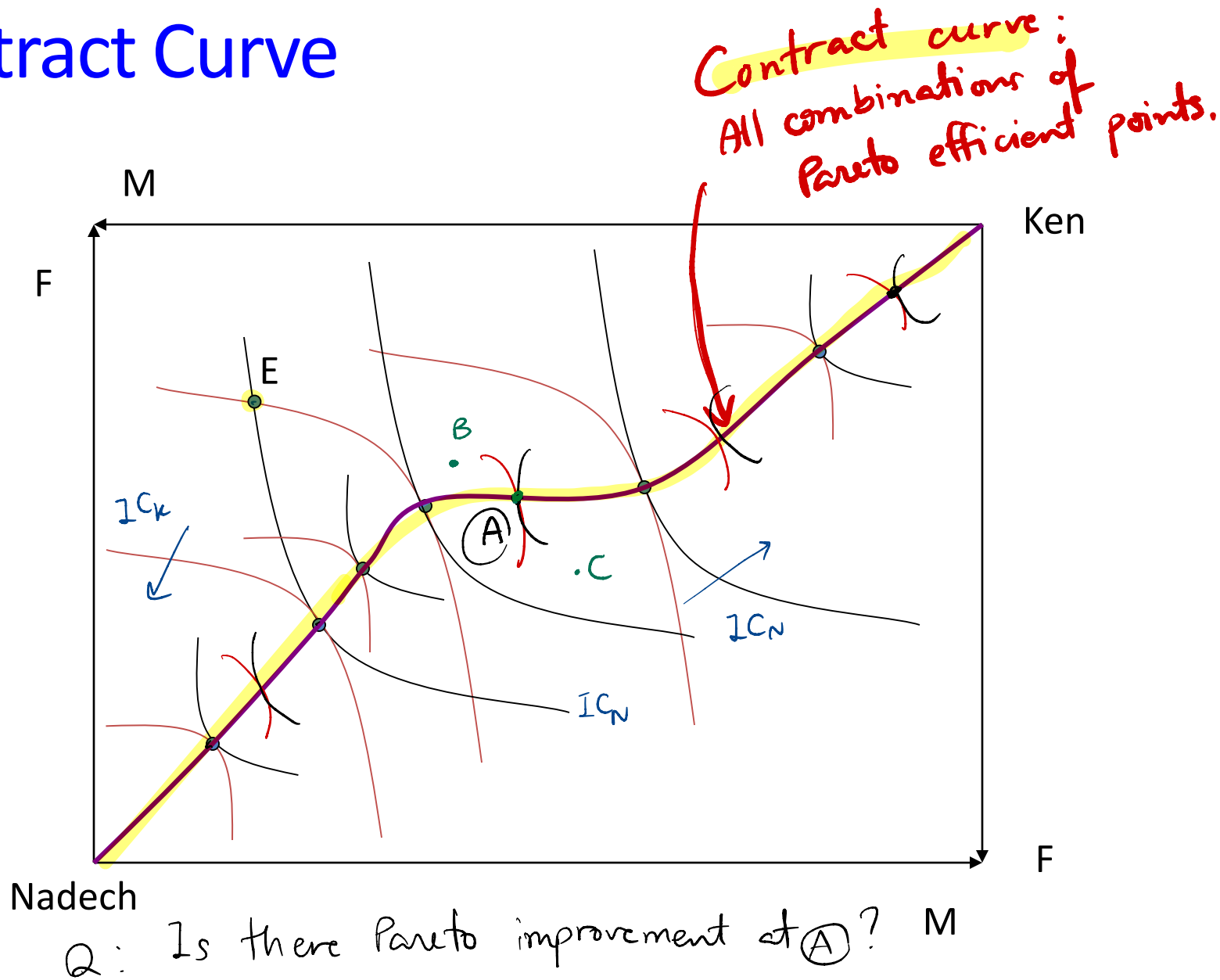
Yes! N is better off & K is equally well off as better.



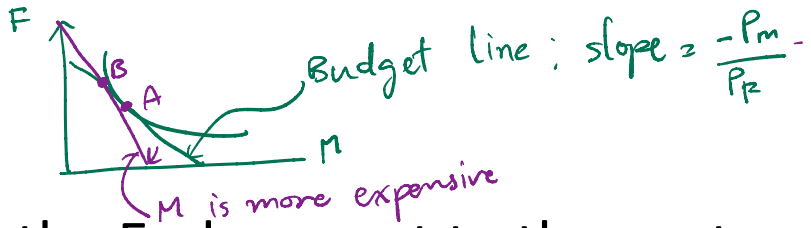
Q: Is E → B Pareto improvement?

No! b/c N is better off, K is worse off.

Contract Curve



Offer Curve

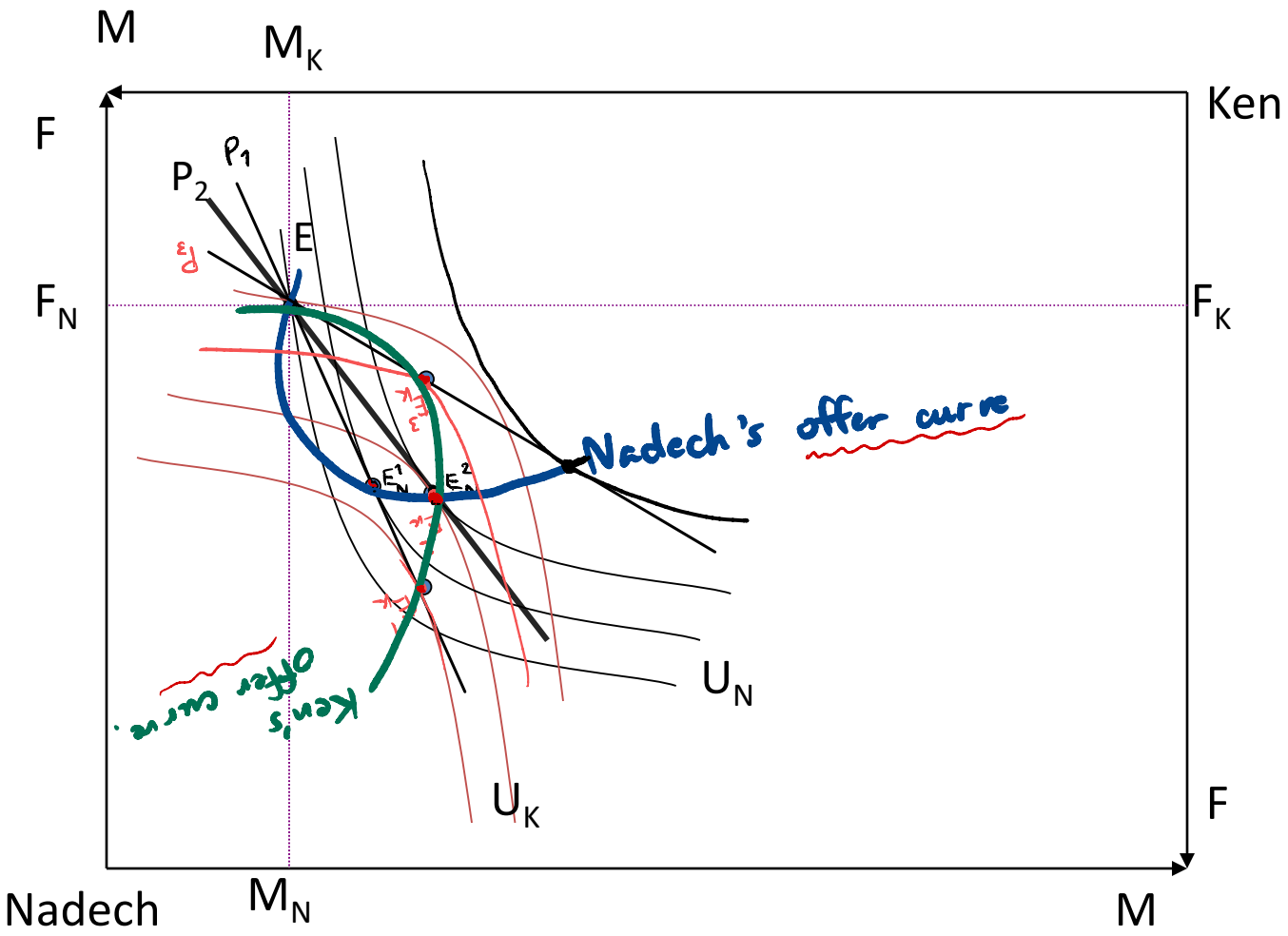


- Question: How do you get from the Endowment to the contract curve?

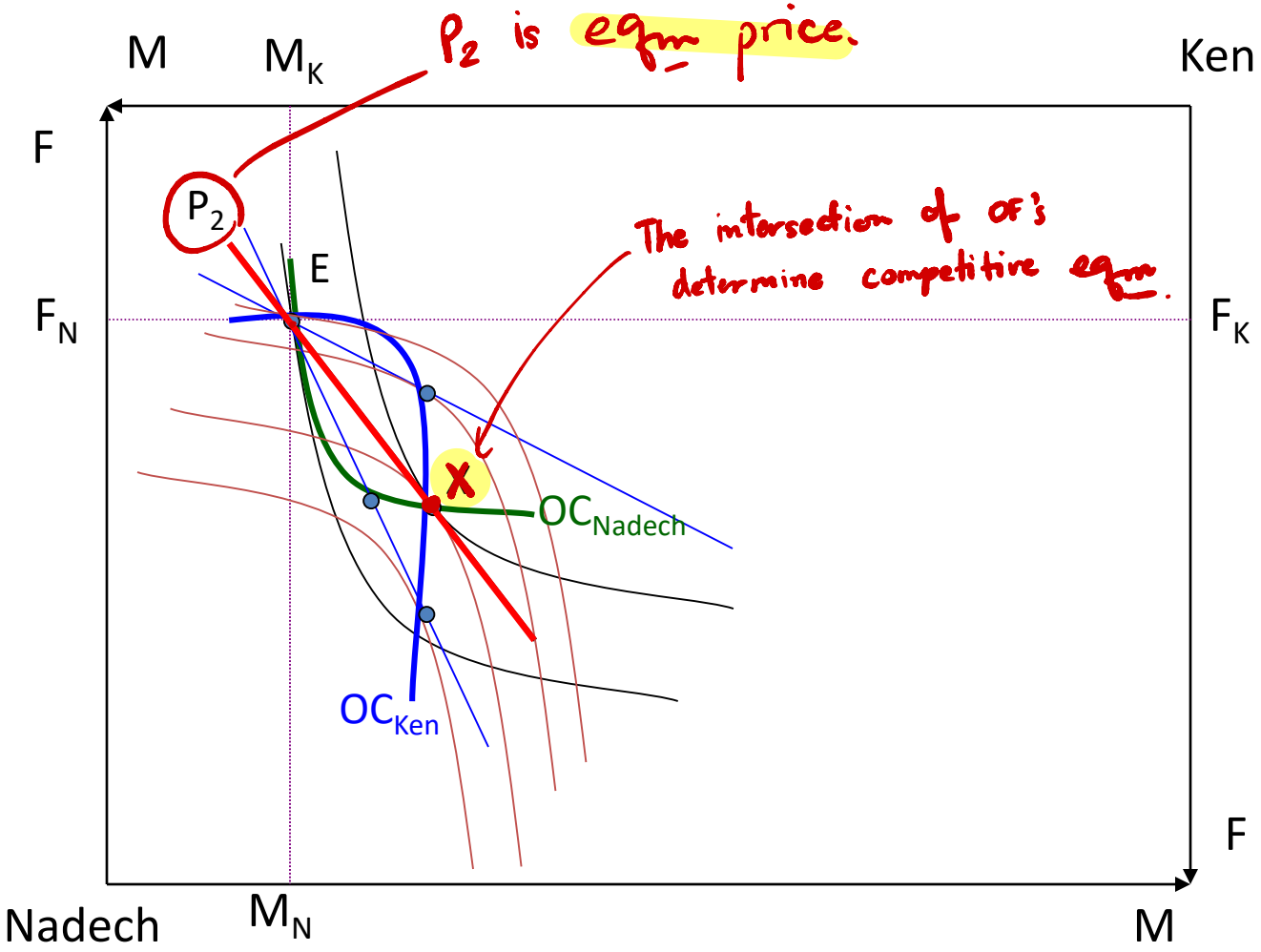
P_M vs. P_F

- There are various possible prices that tell how much food you would have to trade for a unit of medicine.
  - High prices mean that medicine is expensive in terms of the food you must give up, and so the budget line would be steep. →
  - By the same logic, lower prices mean the price line is flatter.
- Nadech would respond to each price called by an auctioneer by offering to make a different optimal trade
- Nadech's offer curve traces out these optimal trades as the prices change.

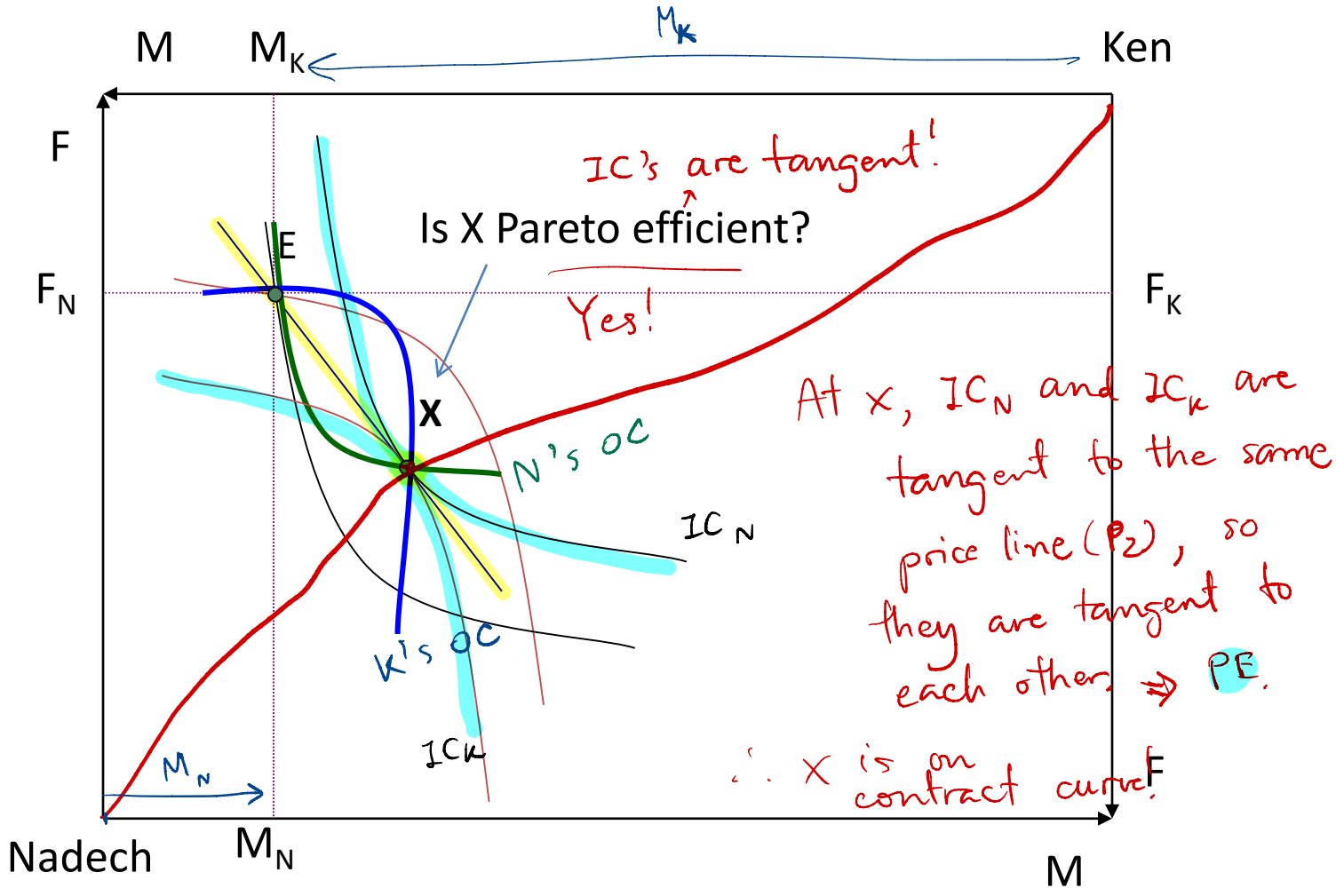
Offer Curves



Competitive Equilibrium



Pareto Efficiency & Competitive Equilibrium

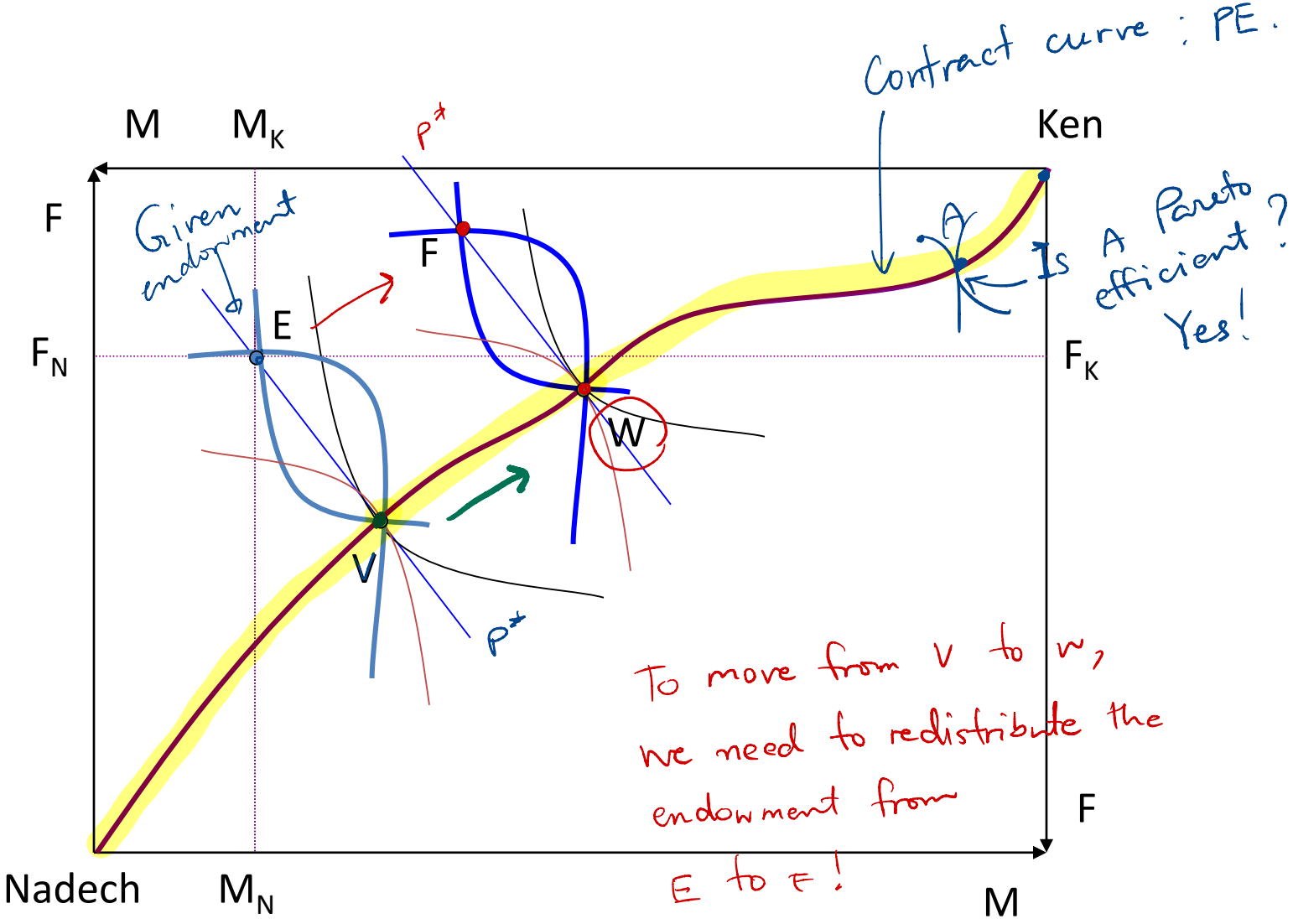


First Welfare Theorem

CE → PE
Competitive eqm. Pareto efficiency

- The First Fundamental Welfare Theorem states that under specified conditions, competitive markets lead to Pareto efficient outcomes. *
- The specified conditions include:
  - ✓Each consumer is "selfish" (ie. No interdependences among consumers).
  - ✓Each consumer is a price taker.
  - ✓Both consumers must face the same price.
  - ✓Demand and supply must be equal for each commodity. - no waste.
- Question: Can we achieve competitive market in health care?

Redistribution of the Endowment



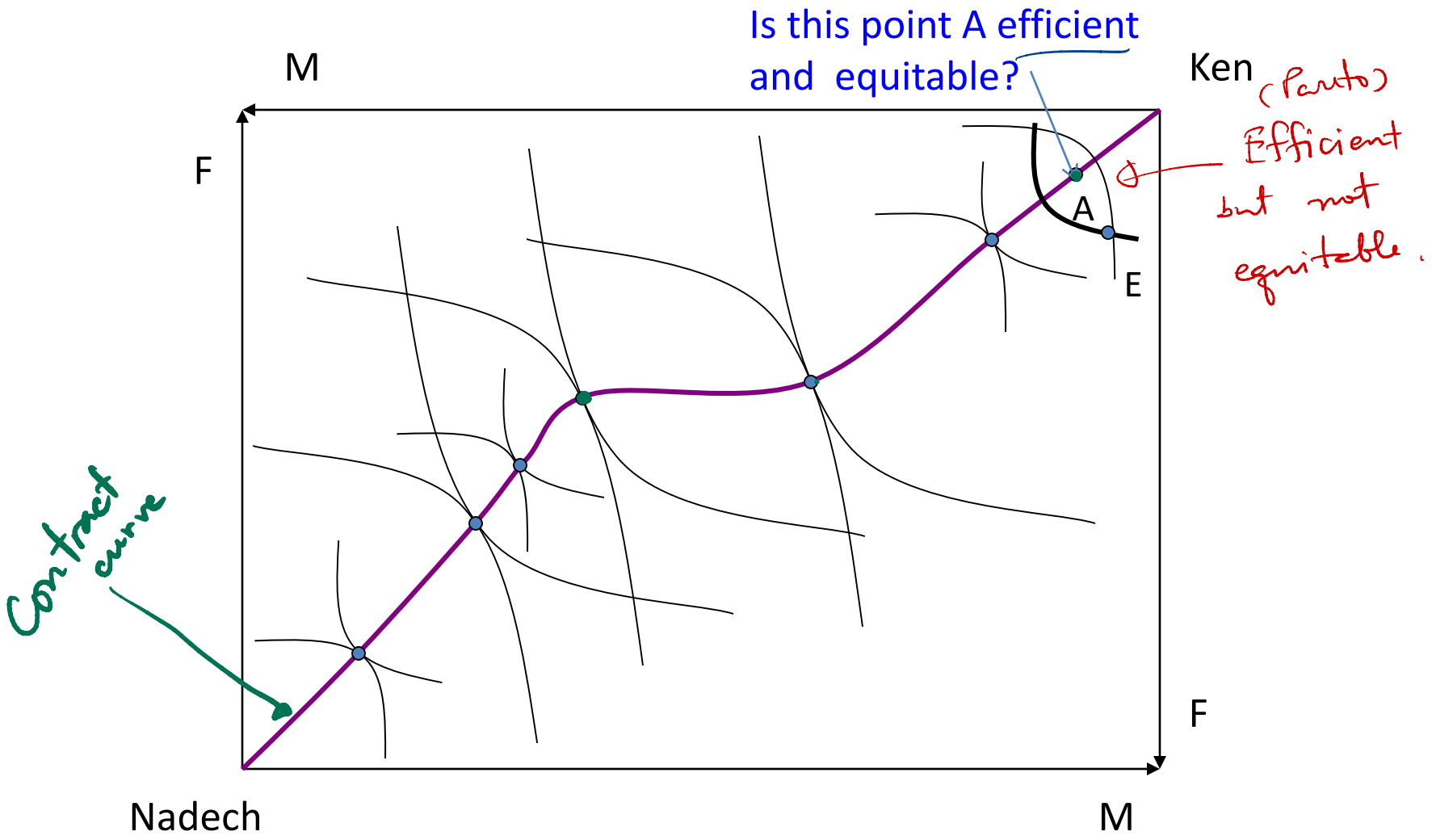
Second Welfare Theorem

- The Second Fundamental Welfare Theorem states that any Pareto efficient outcome can, in principle, be achieved by competitive markets, given an appropriate initial endowment.
- Requirements for the second welfare theorem to hold: Each consumer's preference is selfish, convex, and continuous.
- The second welfare theorem guarantees the existence of price systems that show the relative worth of commodities.
  - Redistribution together with competitive markets generates efficient and equitable outcome.

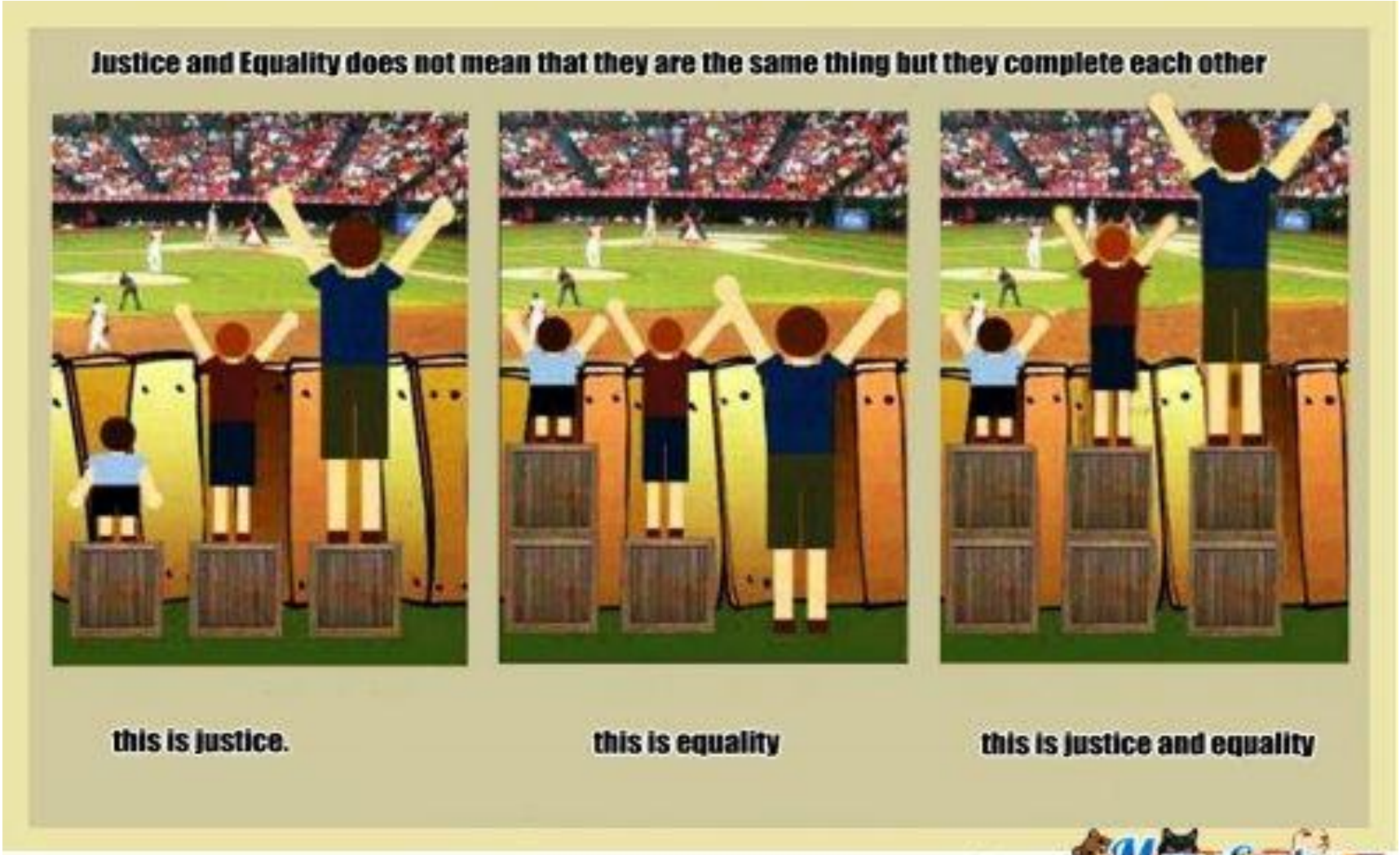
Efficiency and Equity

- The competitive equilibrium does not achieve equity.
  - Efficiency is making the economic pie as big as possible.
  - Equity is how you slice the pie.
- Consumers can be improved from a given endowment, and that is efficiency.
- But the endowment itself may be inequitable.
- Economists are missing 2 big evaluative measures
  - Being able to evaluate the relative utilities that Nadech and Ken get from food and medicine (interpersonal comparisons of utility).
  - Even with relative utilities, being able to evaluate who is deserving of utility from food and medicine (social welfare function).

Efficiency vs. Equity



Equality and Justice = Equity



Deviation from Competitive Model in the Health Care Sector

- Assumptions under a perfectly competitive market:
  - ✓Free entry and exit
  - ✓Perfect information
  - ✓Homogeneous product
  - ✓Many buyers and sellers who are "price takers"
- Efficiency condition requires no externalities, public goods, or natural monopolies exist.
- In the competitive markets:
  - ✓Consumers maximize their utility.
  - ✓Producers maximize their profit.

Market Failures

Departures From Perfect Competition in the Health Care Sector

- Barriers to entry exist. → Monopoly
  - eg. Licensure → low competition → high price
  - signaling → ↓ asym info
- Firms have monopoly power.
  - "Patent" → incentives for R&D
  - → high price
- Health care services are not uniform in quality or other characteristics. Not homogenous (same doctor, different outcome)
- Motivations other than pure profit are common. Altruism, U(quality), Donation
- Markets operate under uncertainty.
- Information problem exist. Asymmetric info → adverse selection, moral hazard
- Externalities are prevalent.
  - +ve → "herd immunity"
  - -ve → "alcohol" consumption, smoking

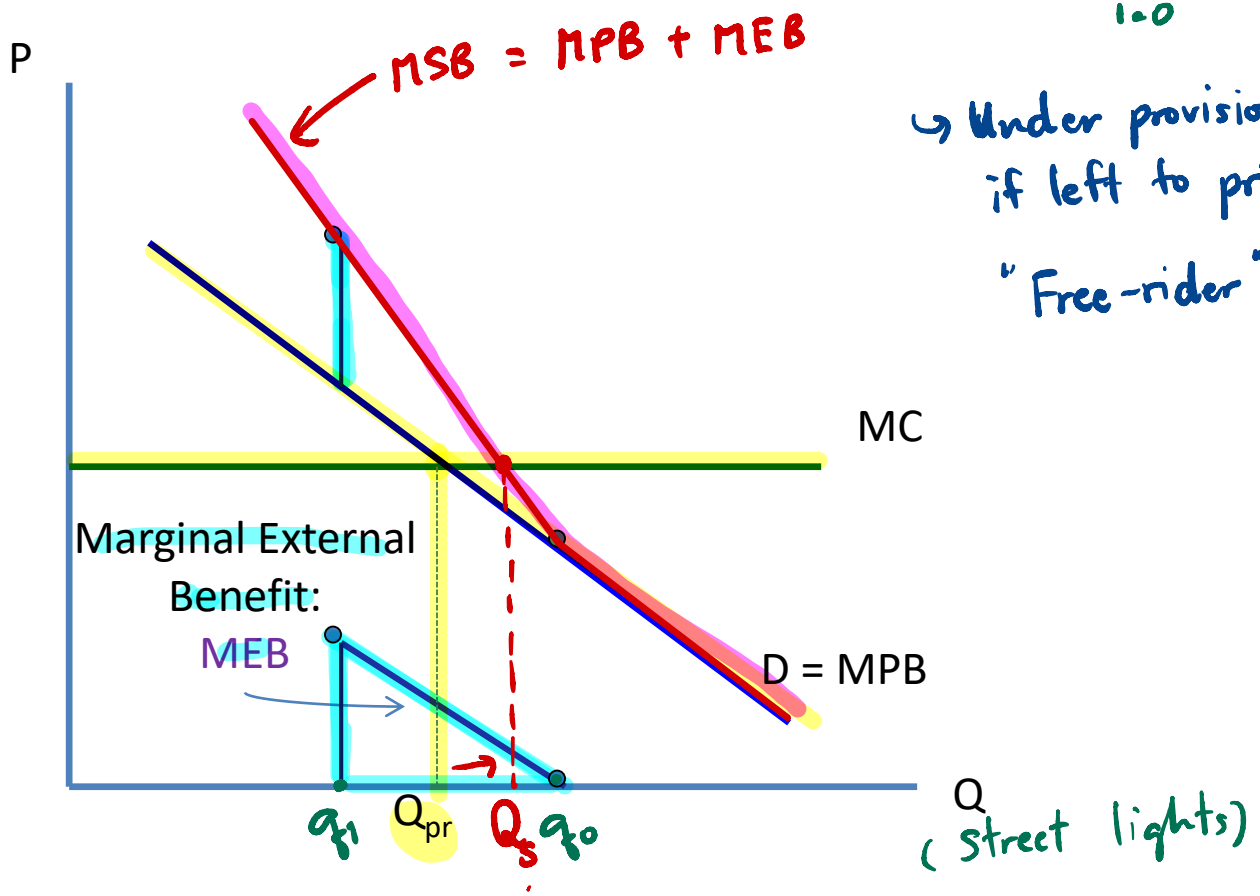
Theorem of the Second Best

- In an economy with more than one departure from the conditions of perfect competition, any policy that corrects some of these departures (but not all) may not necessarily improve society's welfare.
- Example: Licensure law
  - A policy that eliminates the monopoly power created by licensure may not address information problem.
- Thus, according to the Theorem of the Second Best, we cannot assume competitive policies will improve welfare.
  - Because it is impossible to correct all departures from perfect competitive, we need to operate in the world of second best.

Socially Efficient Equilibrium in the Presence of a Beneficial Externality

"Public goods"

$$MSB = \sum_{i=0}^{q_i} MPB_i$$



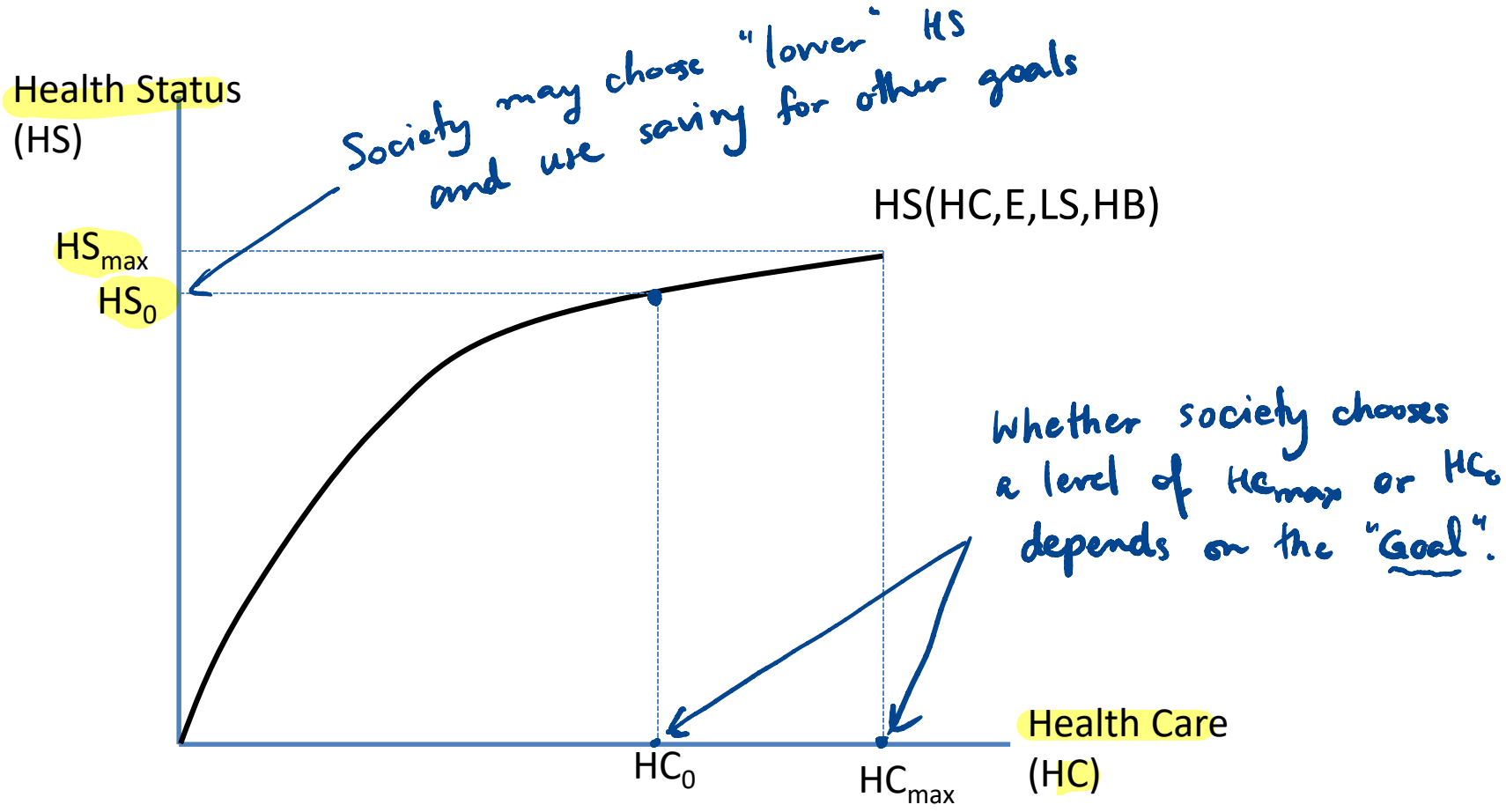
↳ Under provision of the goods if left to private sector.

"Free-rider"

Need and Need-Based Distribution

- In the health care literature, the concerns for equity most often center on the question of whether people are getting the health care they need.
- Culyer and Wagstaff (1993) define need as:
  - the expenditure required to effect the maximum possible health improvement or, equivalently, the expenditure required to reduce the individual's capacity to benefit to zero. (p. 436)
- In contrast, some analysts or policy makers treat health care need as a minimal requirement or standard of adequacy.

Defining Need: Health Production Function

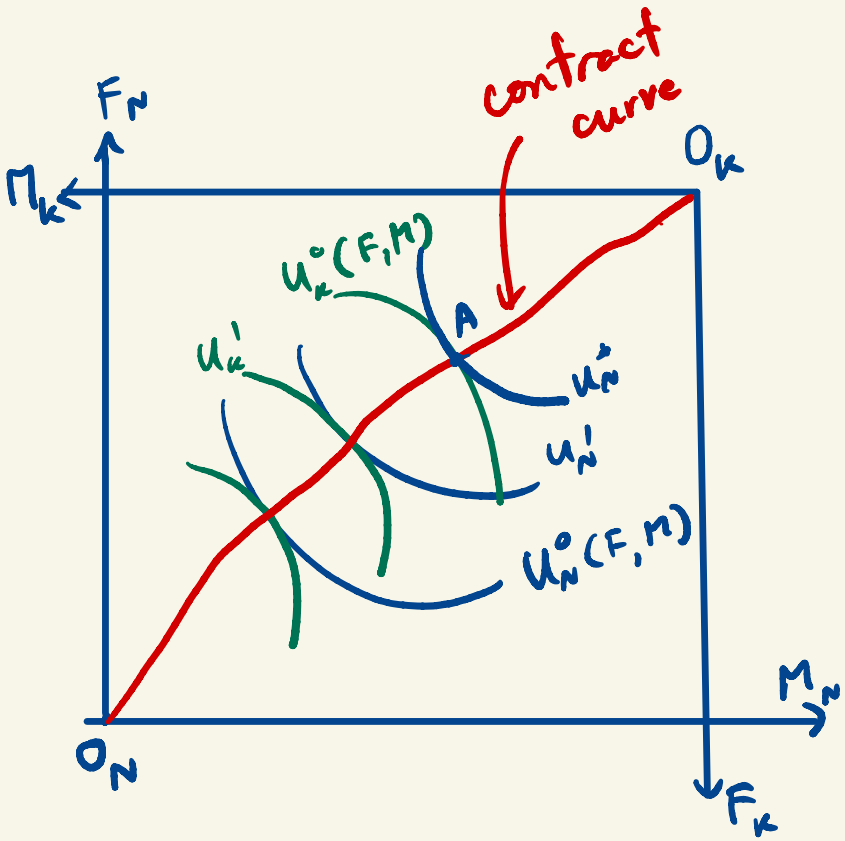


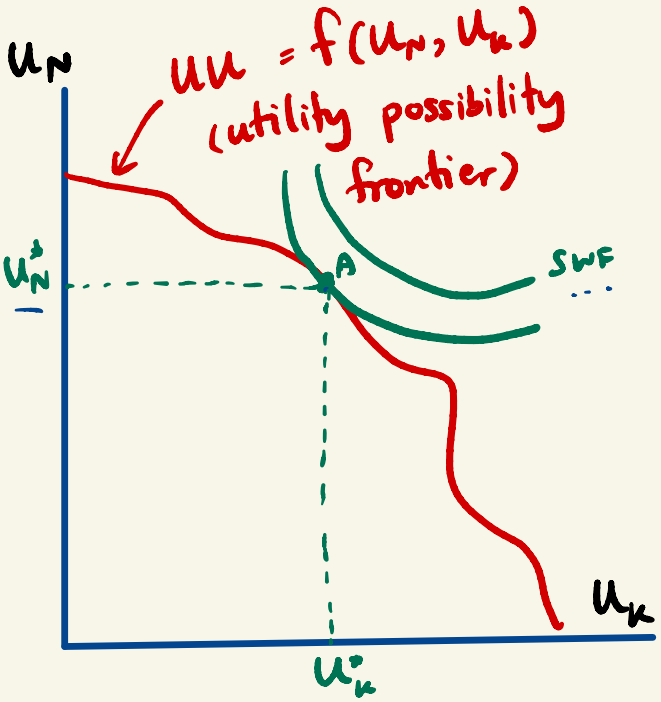
Utility Possibility Frontier and Social Welfare Function

- The utility possibility frontier (UU) shows the various combinations of utility that can be achieved.
  - UU can be traced out from the points in the Edgeworth Box. By re-allocating resources from Nadech to Ken as we move along the contract curve, UU can be drawn.
- Social welfare function is the set of rules by which societies operate – through debate, consensus, or even dictatorship.
- Commonly used form of the social welfare function:

$$SW = f(U_1, U_2, \ldots, U_n)$$

  - Each person's utility depends on his/her consumption of the available goods, including health care.


F_N
M_K
O_K
contract curve
$U_K^0(F,M)$
A
U_K^1
U_N^*
U_N^1
$U_N^0(F,M)$
M_N
O_N
F_K

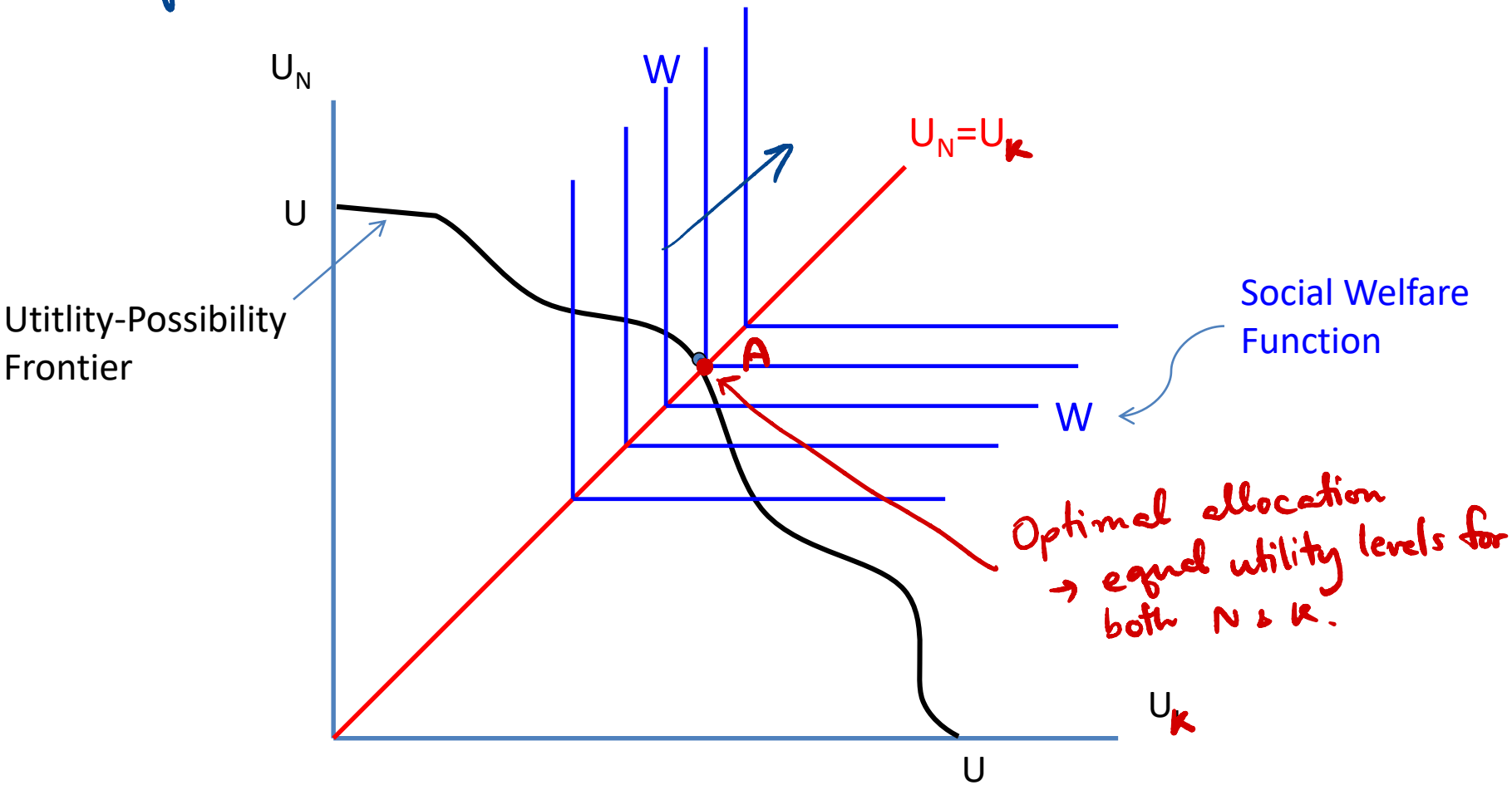

U_N
$UU = f(U_N, U_K)$
(utility possibility frontier)
U_N^*
A
SWF
U_K
U_K^*

Social Welfare Maximization:

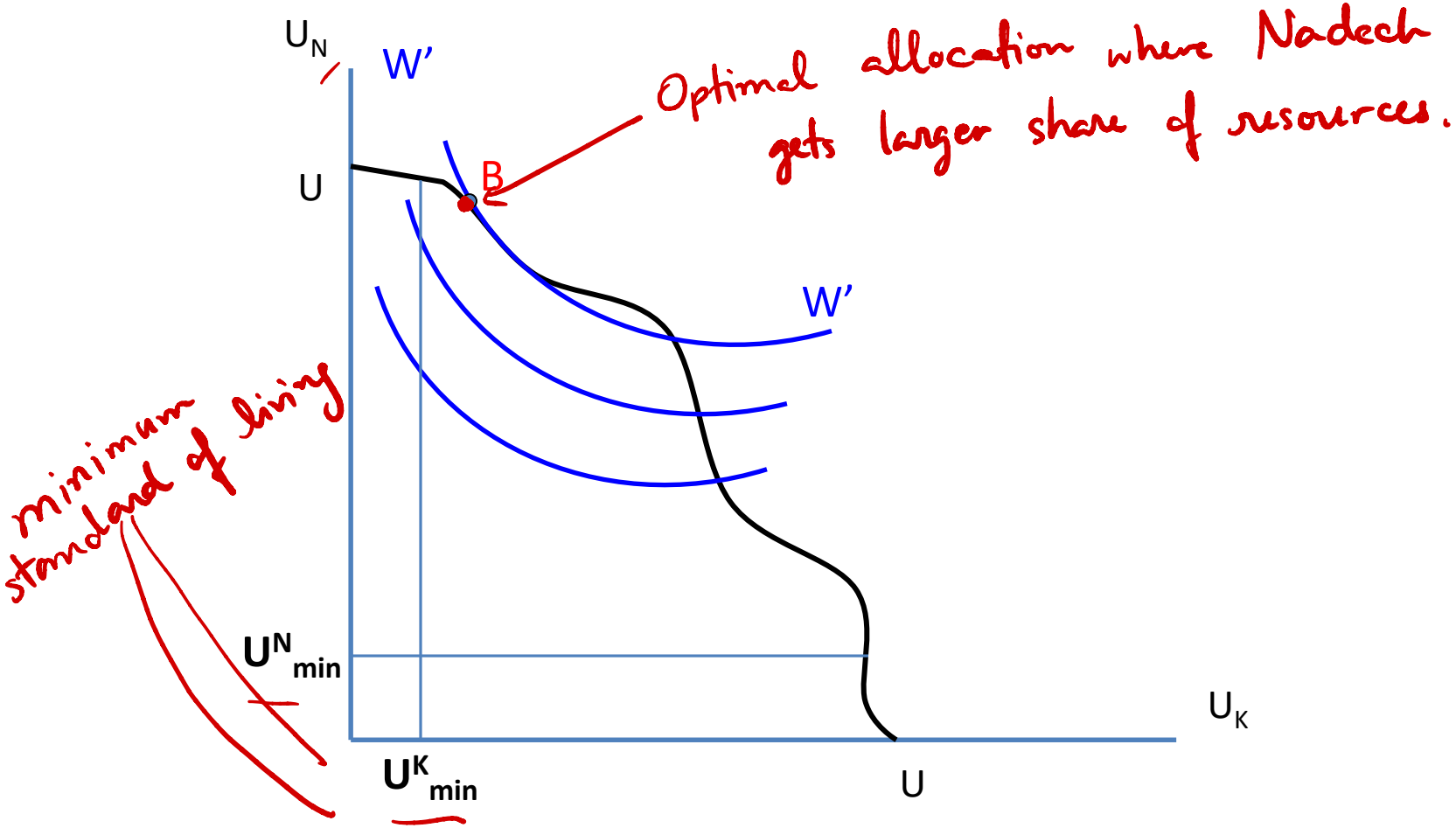
Egalitarian Preference

(Right-angle SWF)

= equal



Social Welfare Maximization:
Preferences Favoring Nadech

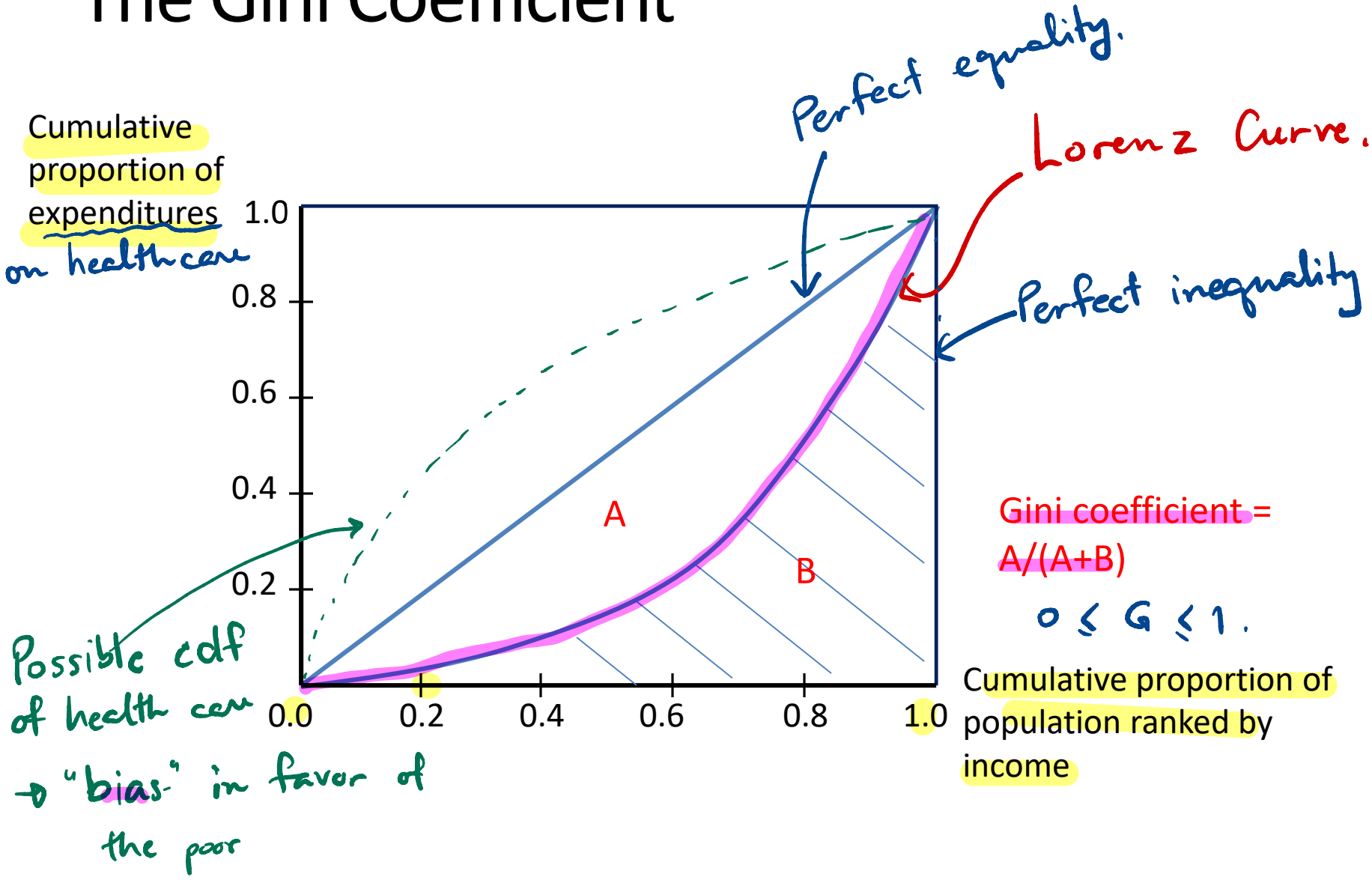


Horizontal Equity and Needs

tax (Public Finance)

- Vertical equity vs. Horizontal equity
  - Vertical equity means treating differently those who have different 'needs'.
  - Horizontal equity means providing equal healthcare to those who have the same 'need'.
- Horizontal equity is the requirement that equal people be treated equally. → our concern here!
- Health care equity has most often been compared across countries using a modified Gini Index. → measure horizontal equity

The Gini Coefficient



Other Measures of Horizontal Equity

- Concentration Index (van Doorslaer, Koolman, and Jones, 2004; Koolman and van Doorslaer, 2004) :

$$C_M = \frac{2}{\bar{y}} Cov(y_i, R_i)$$

$C_M > 0$: bias for the rich,

$C_M < 0$: bias for the poor

where $$Cov(y_i, R_i) = \sum_{i=1}^{n} \frac{(y_i - \bar{y})(R_i - \bar{R})}{n}$$

and y_i is the health care utilization of income group i, $\bar{y}$ is the mean health care use in the population, and R_i is the cumulative fraction of the population in fractional income group i.

- Health Inequity (*HI*) index:

$$HI = C_M - C_N$$

Health care inequality after removing variation attributed to need.

where C_N is the concentration index for health need.

Health Care Inequality Measures Across Several Countries

	C_M	*HI*	C_M	*HI*
	GP Visits Total	**GP Visits Total**	**Spec Visits Total**	**Spec Visits Total**
Ireland	−0.1323*	−0.0696*	0.0770*	0.1388*
Belgium	−0.1145*	−0.0508*	−0.0269	0.0255
Spain	−0.0906*	−0.0492*	0.0267	0.0740*
Luxembourg	−0.0918*	−0.0406*	−0.0704*	−0.0282
Italy	−0.0649*	−0.0349*	0.0179	0.0537*
Greece	−0.1258*	−0.0308*	−0.0418*	0.0492*
Germany	−0.0636*	−0.0268*	0.0158	0.0517*
UK	−0.1006*	−0.0240*	−0.0234	0.0524*
Netherlands	−0.0535*	−0.0113	−0.0178	0.0413*
Denmark	−0.0831*	−0.0008	0.0223	0.0844*
Portugal	−0.0692*	−0.0051	0.0971*	0.1604*
Austria	−0.0499*	−0.0146	0.0345	0.0740*

Note: C_M is the Concentration Index and *HI* is the Health Inequality Index, both of which are described in the text. The table is created from data published in van Doorslaer, Koolman, and Jones, *Health Economics*, 2004, Tables 1 and 2, pp. 637–38, with permission. An asterisk indicates that the estimated value is significant at the 5 percent level or better. "GP" stands for general practitioner, and "Spec" stands for specialist.

+ve & significant → favor the rich

-ve and significant. → favor the poor

Concluding Remarks

- In addition to positive analysis, an ethical theory serves to identify a context and reasoning by which to determine what *ought to be done* (i.e. what is optimal health care allocation?).
- Ethical theories that serve to determine a *fair* or *just* distribution of economic resources are sometimes called theories of social justice (e.g., Utilitarianism, Libertarian)
- Which ethical theory is chosen depends on the "social" values, or the norm in the society.
  - E.g. If we have egalitarian preference, then we may put more emphasis on equity than on efficiency.