

# Efficiency, Equity, and Need

EE 474 Health Economics  
Semester 1/2012

# 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
- Theories of Social Justice

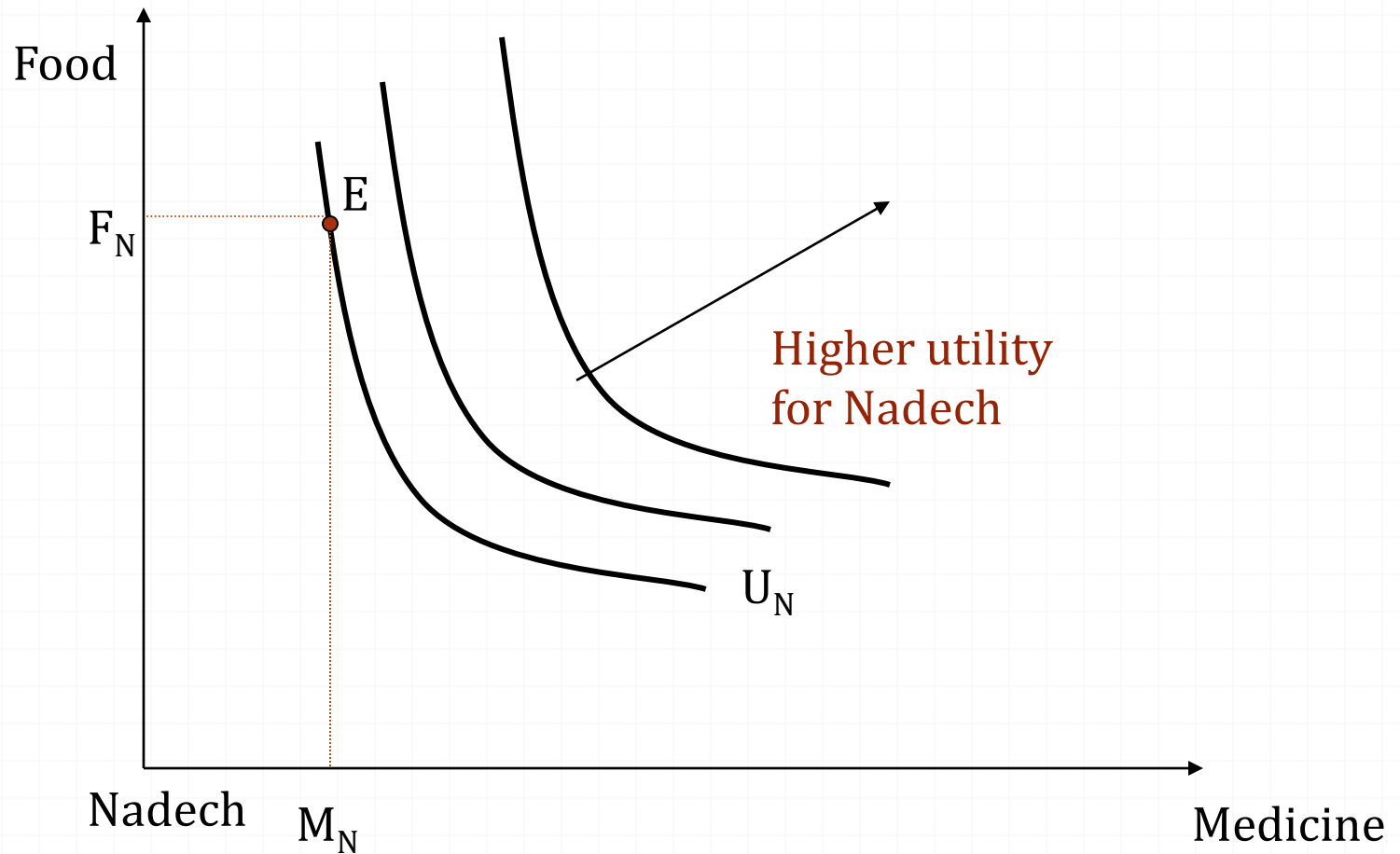
# Pareto Efficiency

- o Recall the 4 basic questions from the first lecture:
  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?
  3. What specific health care resources should we use to produce the chosen health care goods and services?
  4. Who should receive the health care goods and services that are produced?
- o This lecture will address the last question.
  - o How to distribute health care goods and services across consumers.

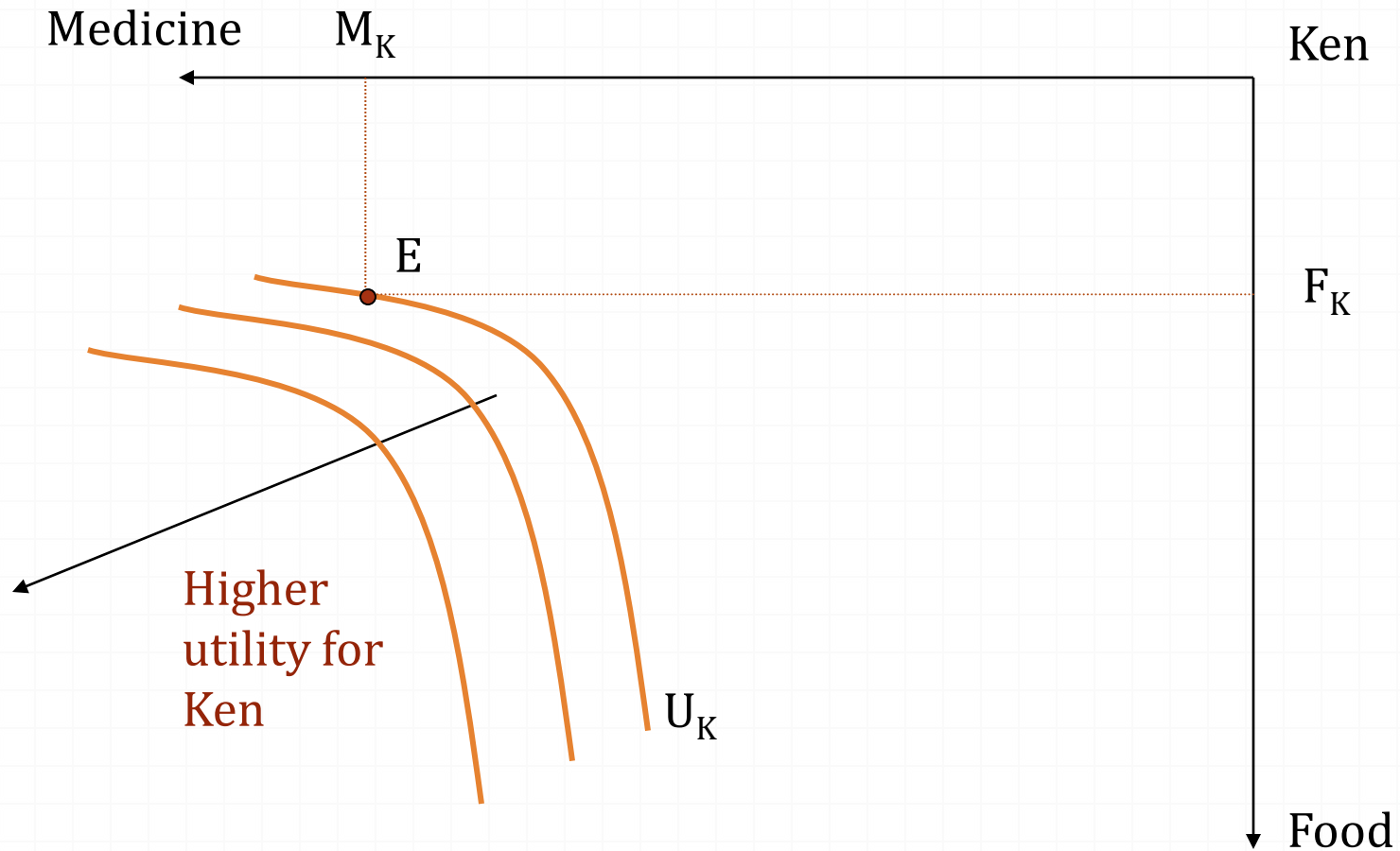
# Pareto Efficiency (Optimality)

- 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 an exchange that helps someone without hurting another.
- These concepts can be applied to production by firms, but we will limit our discussion to a **pure exchange economy** and the distribution of commodities among consumers.
- **Pareto efficiency** and **Pareto improvement** can be illustrated with an **Edgeworth box**.

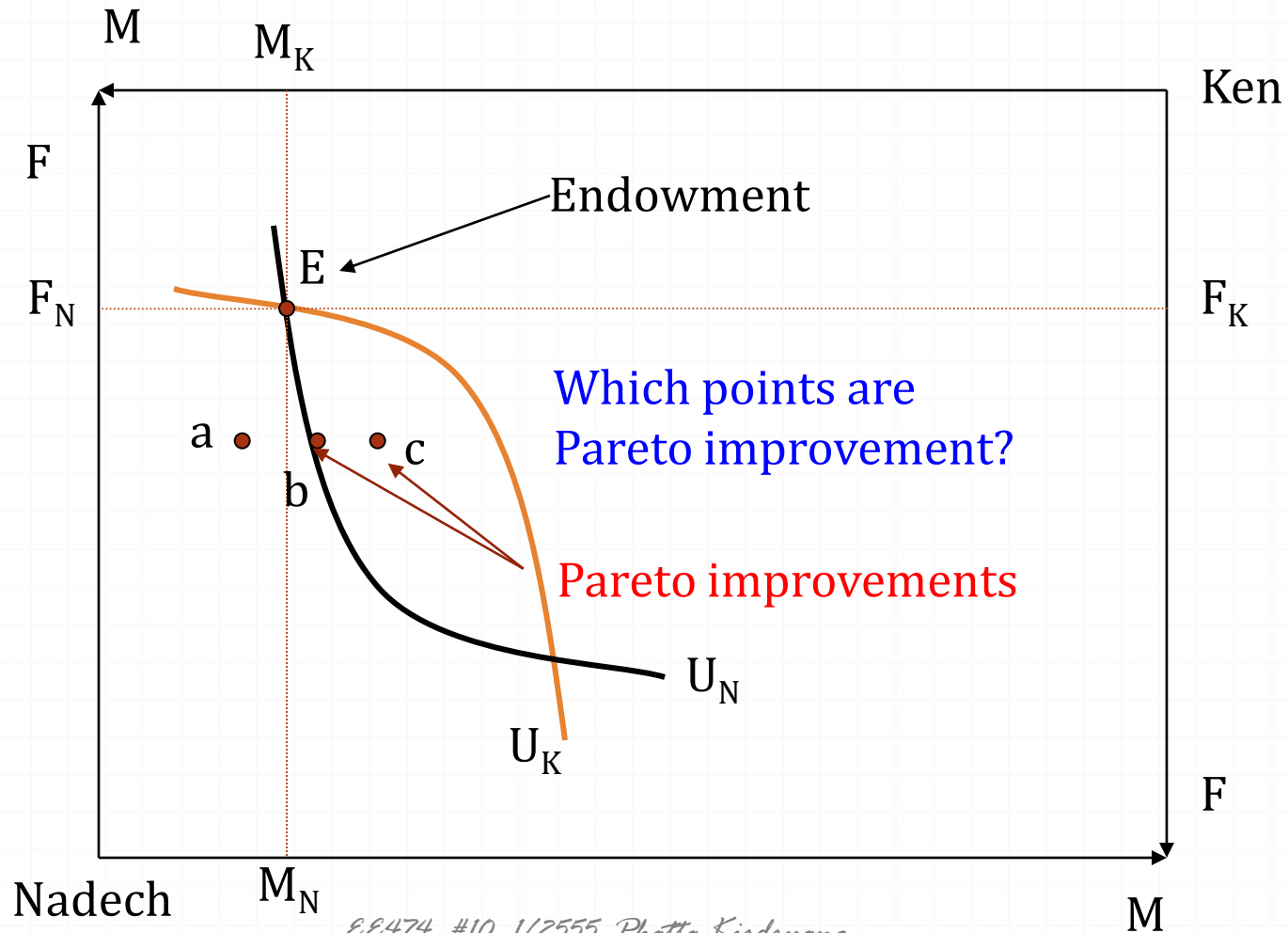
# Nadech's Indifference Curve for Food and Medicine



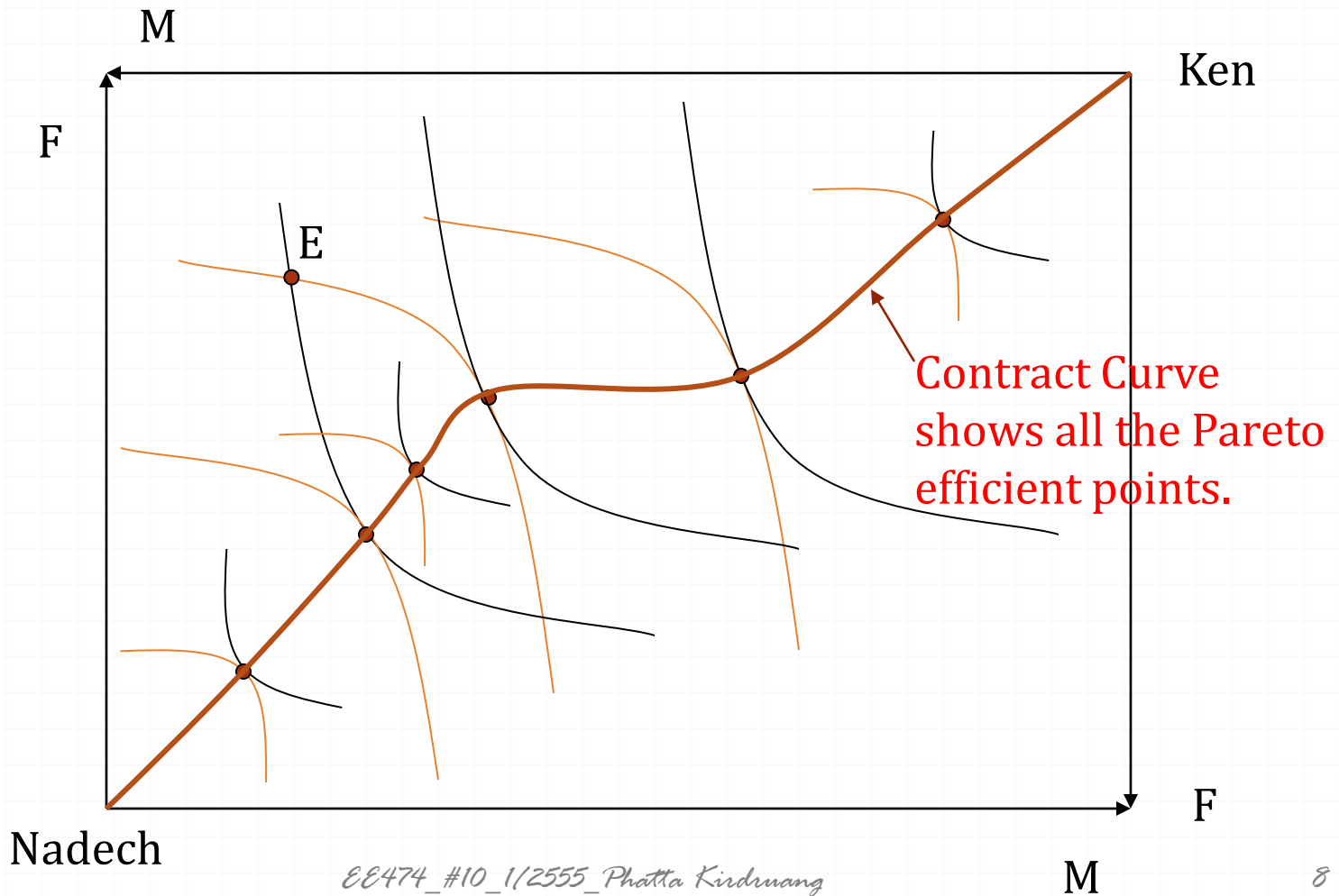
# Ken's indifference curve for Food and Medicine



# Edgeworth Box and Pareto Improvement



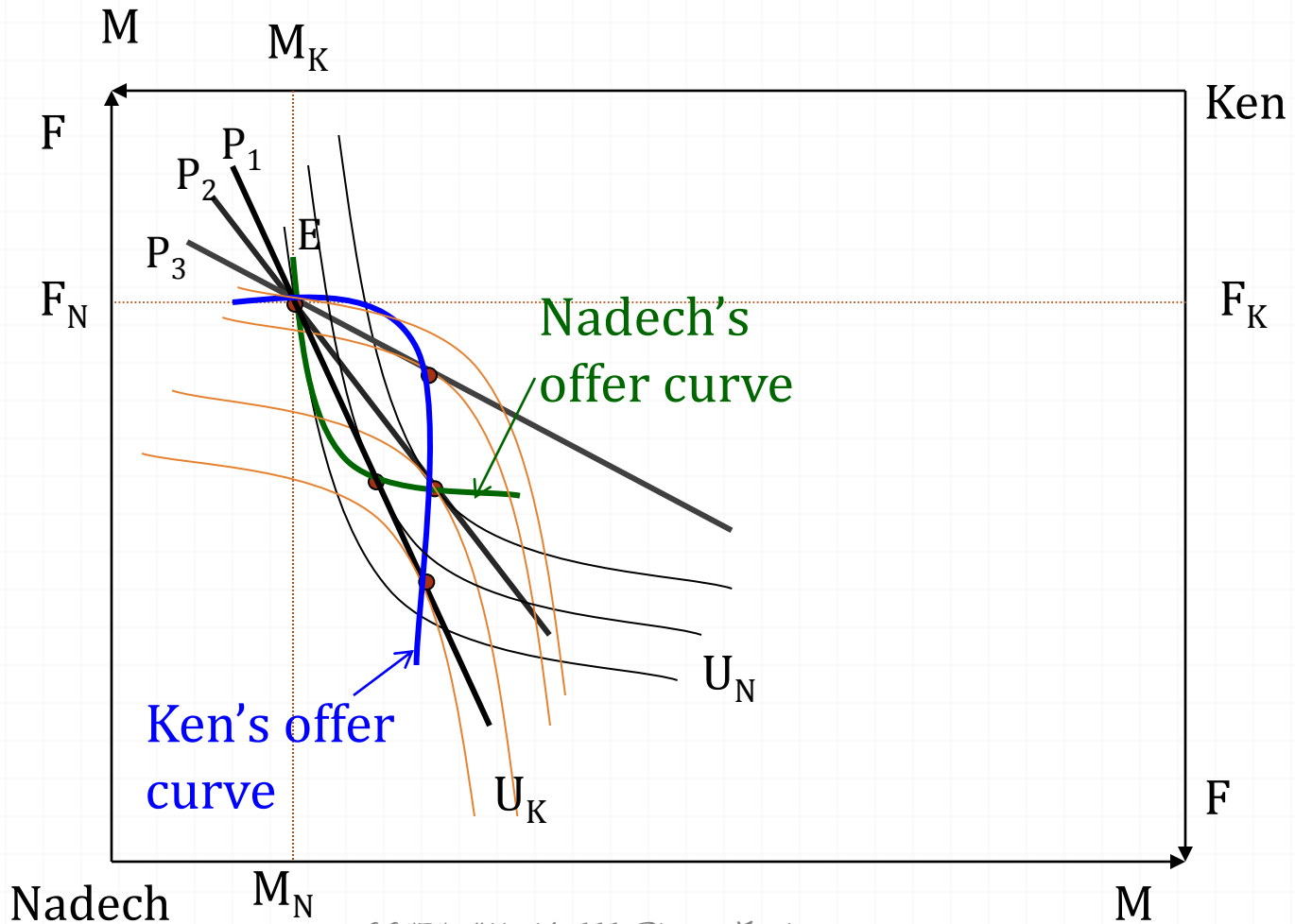
# Contract Curve Shows All the Pareto Efficient Points



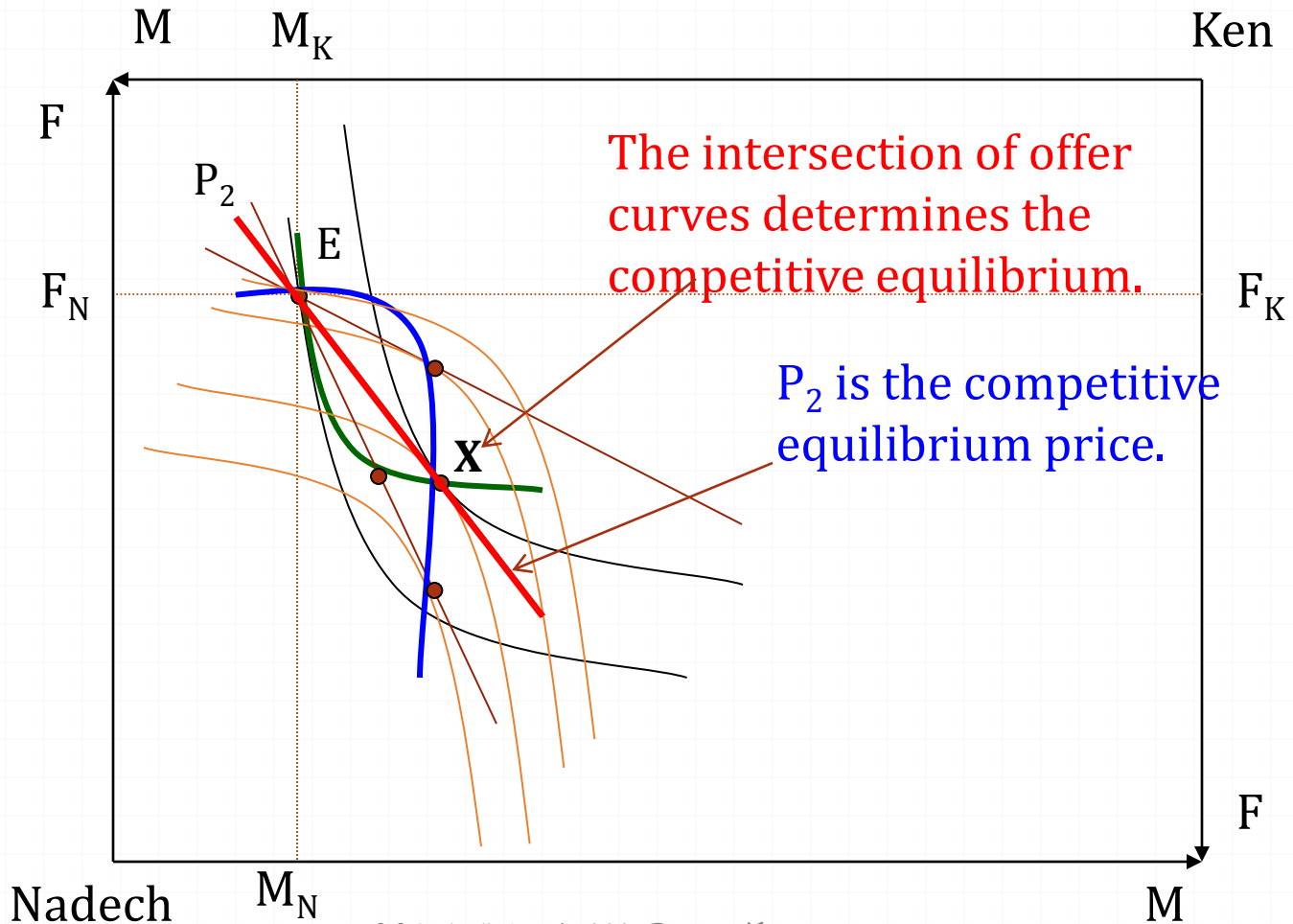
# Offer Curve

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

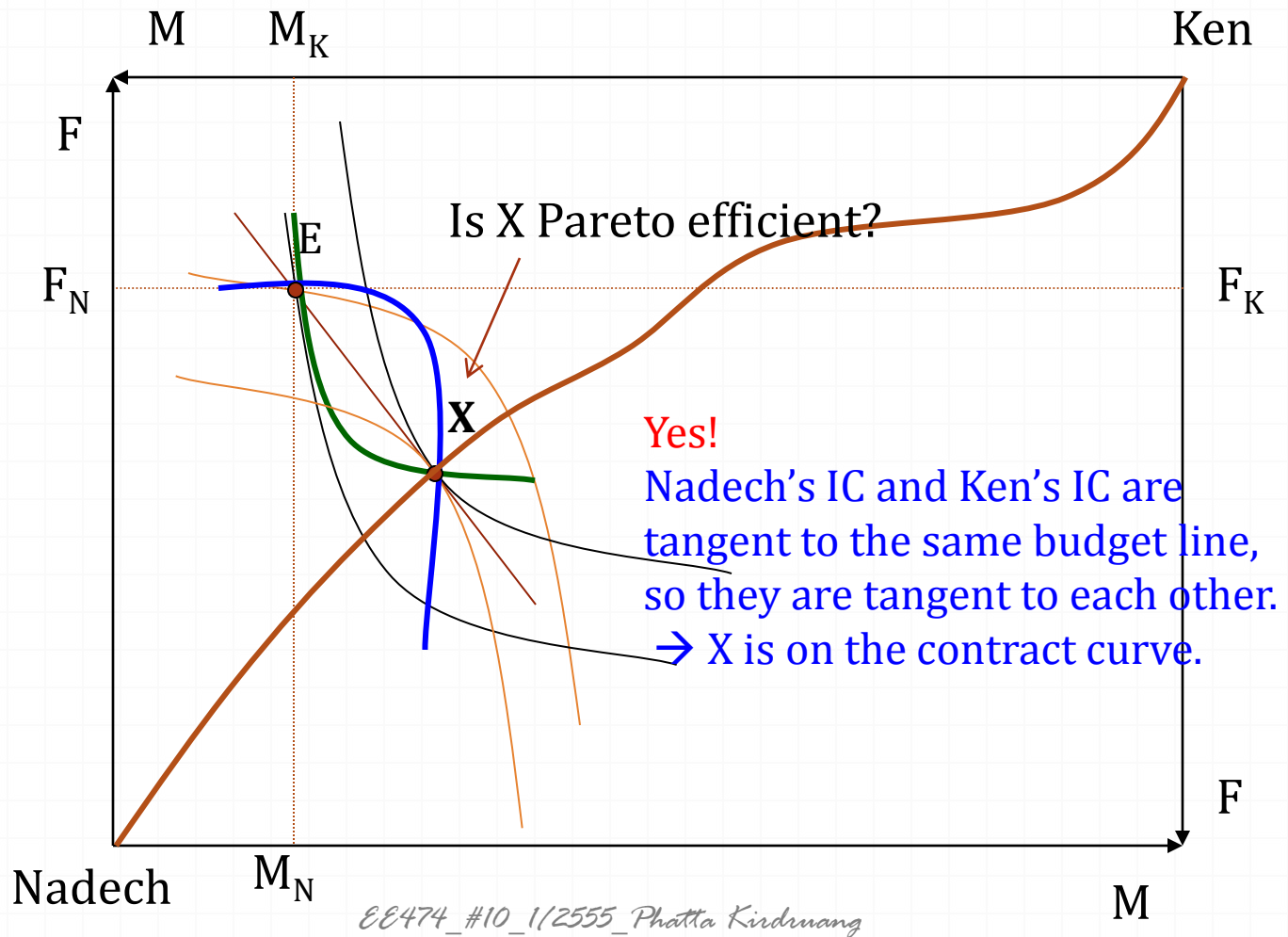
# Offer Curves



# Competitive Equilibrium



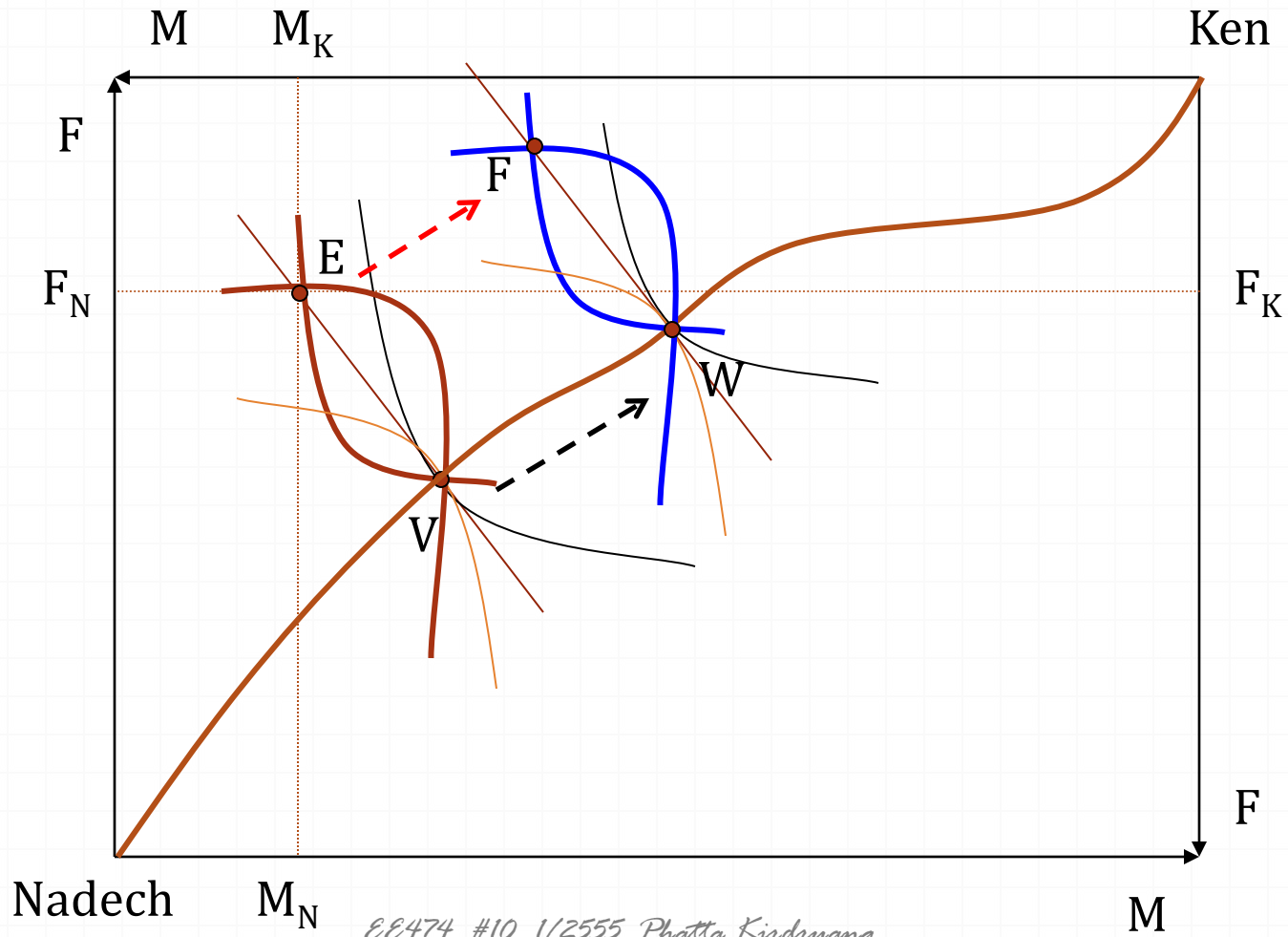
# Pareto Efficiency and Competitive Equilibrium



# First Welfare Theorem

- 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



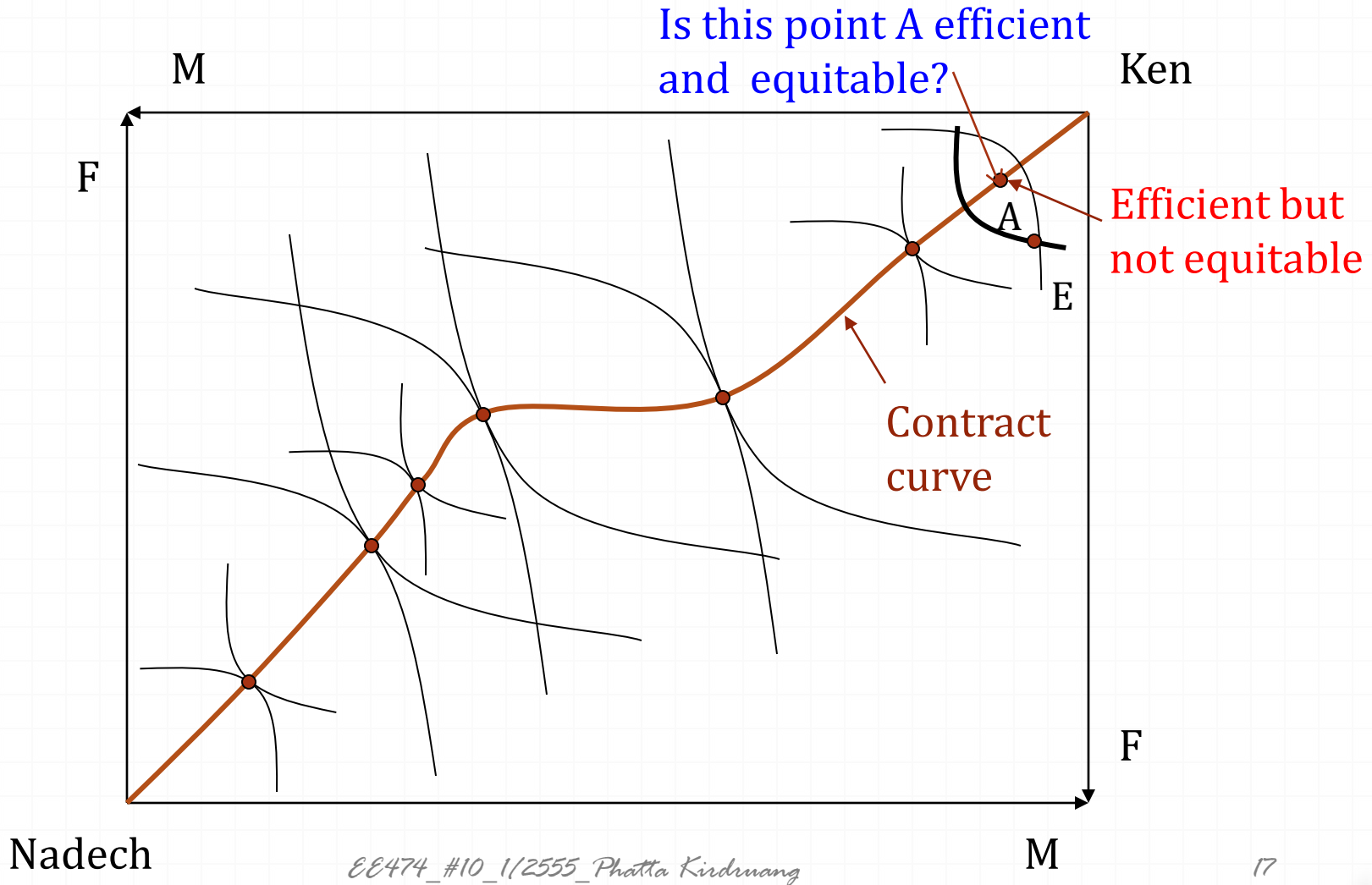
# Second Welfare Theorem

- 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.

# 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



# 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.**

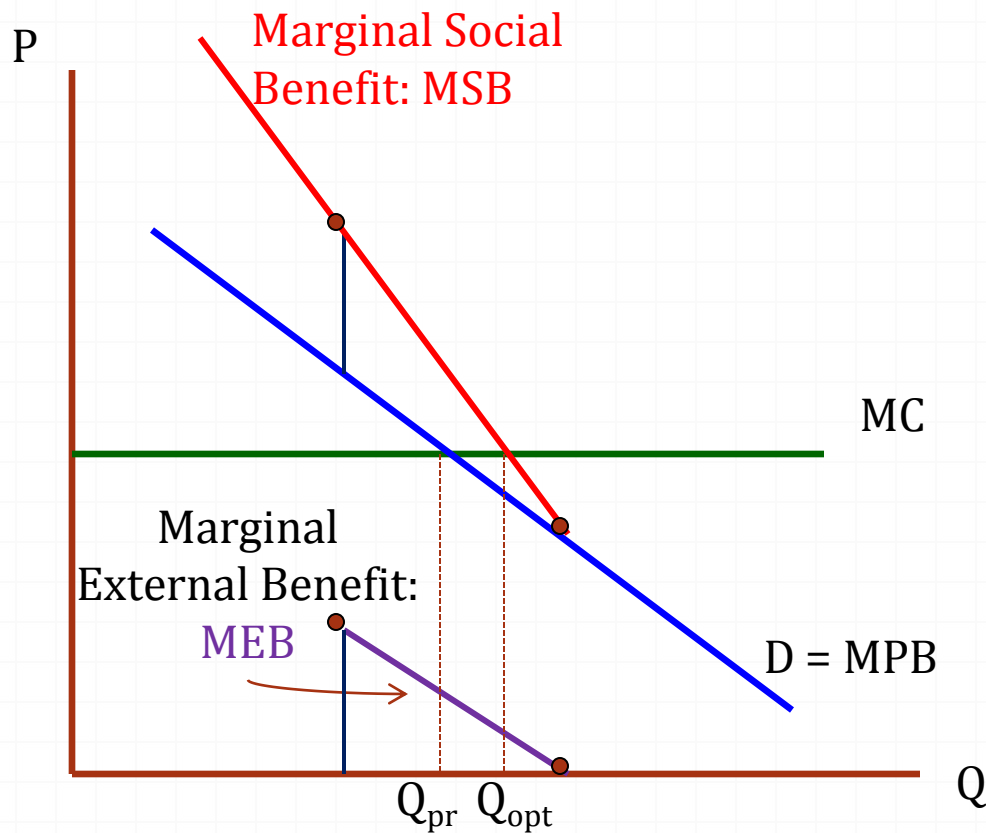
# Departures From Perfect Competition

- Barriers to entry exist.
- Firms have monopoly power.
- Health care services are not uniform in quality or other characteristics.
- Motivations other than pure profit are common.
- Markets operate under uncertainty.
- Information problem exist.
- Externalities are prevalent.

# 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.

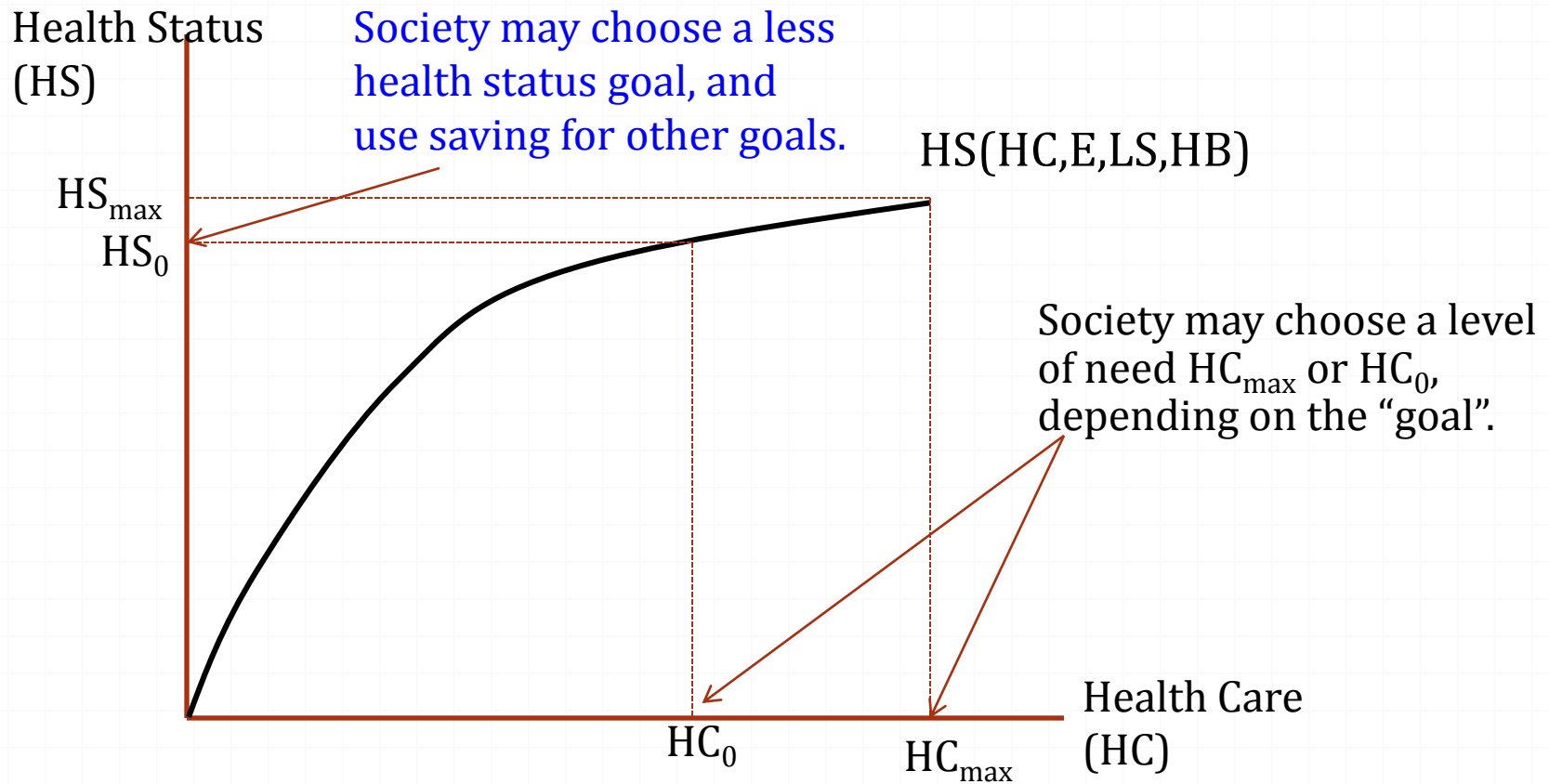
# Socially Efficient Equilibrium in the Presence of a Beneficial Externality



# 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



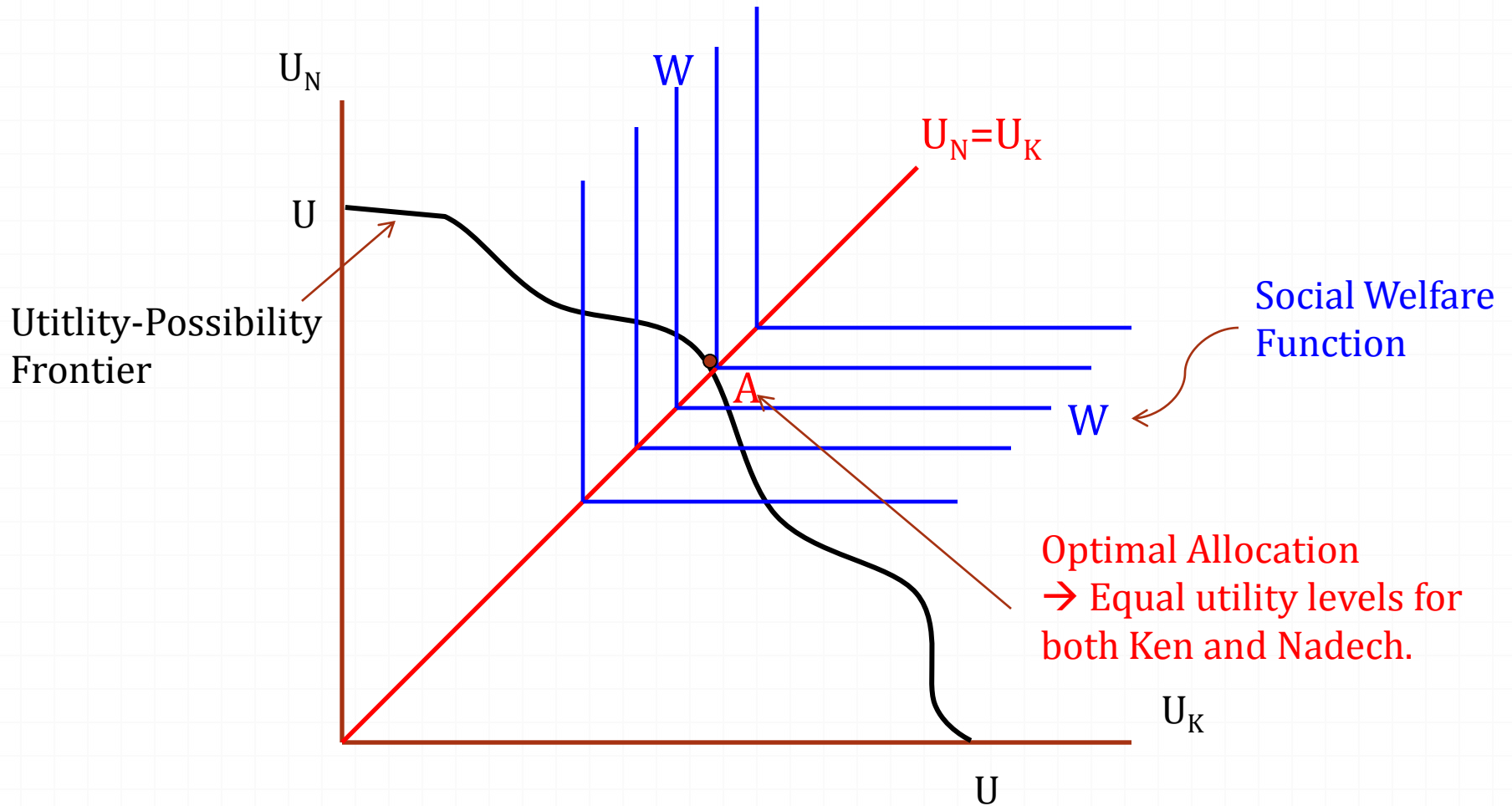
# Utility Possibility Frontier and Social Welfare Function

- 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:

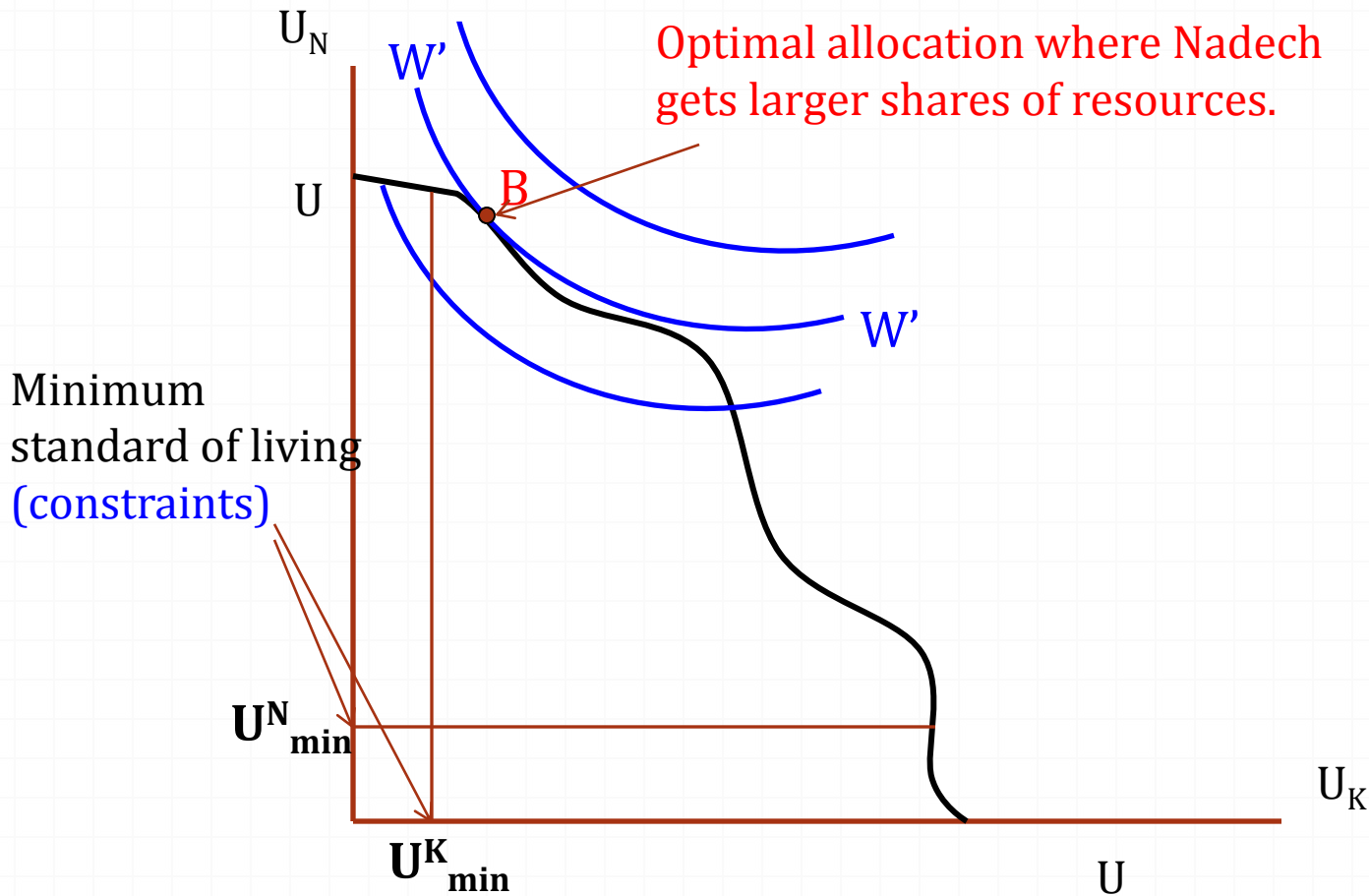
$$SW = f(U_1, U_2, \dots, U_n)$$

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

# Social Welfare Maximization: Egalitarian Preference



# Social Welfare Maximization: Preferences Favoring Nadech



# Welfarist Health Economics and Extra-Welfarist Analysis

- The social welfare function (SWF) approach is referred to as **welfarism**.
- The SWF represents welfarism when it is **based solely on the utilities of the individuals who make up society**.
  - These individuals are assumed to be *rational* and they know what is best for themselves.
- Other salient features:
  - The **mathematical form of the SWF and any equity weights** that may be incorporated in it come from “**outside**” of the **assumptions**.
  - The **concept of utility is variously defined** - sometimes as “**happiness**” and sometimes as only an index of preferences.

# Welfarist Health Economics and Extra-Welfarist Analysis

- The **extra-welfarist** approach **allows valuations other than the individual's utility in the determination of social choice**, and the sources of valuation may be other than the affected individual's (Brouwer et al., 2008).
  - Less individualistic!
- Sen (1980), for example, questions whether a person's utility is a reliable guide to his or her well-being.
  - Suggests that, as an alternative to utility in health policy evaluation, **individuals are entitled to an acceptable level of "capability,"** which includes **health and normal functioning.**
  - Cookson (2005) proposed the **quality of life years (QALYs)** as an **approximate measure of Sen's capabilities.**

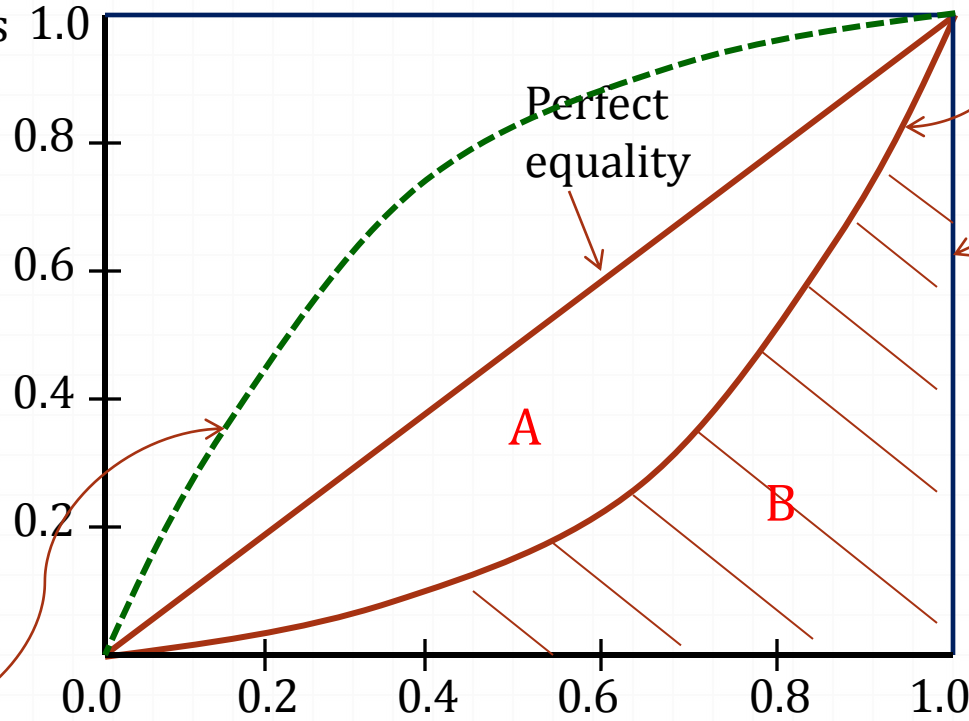
# Horizontal Equity and Needs

- 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**.

# The Gini Coefficient

Cumulative proportion of expenditures

Lorenz Curve



Perfect inequality

Perfect equality

A

B

Gini coefficient =  $A/(A+B)$

Cumulative proportion of population ranked by income

Possible cumulative distribution of health care  
→ "bias" in favor of the poor

# Other Measures of Horizontal Equity

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

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



$C_M > 0$ : bias for the rich,  
 $C_M < 0$ : bias for the poor

where

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

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  $i$ .

- o **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.

# Theories of Social Justice

- An ethical theory serves to identify a context and reasoning by which to determine *what ought to be done*, as opposed to mere positive analysis which describes the case.
- Ethical theories that serve to determine a fair or just distribution of economic resources are sometimes called **theories of social justice**.
  - Utilitarianism
  - Rawlsian
  - Libertarian

# Utilitarianism

- Utilitarianism defines the social welfare function as the sum of individual utilities.
  - *"The greatest good for the greatest number"*
- Society may choose to accept some harm for a few members in return for a greater good for the many.
- Criticisms:
  - This theory is based on the idea that utility could be **cardinally measurable and comparable among people.**
    - Whose utilities are to count?
    - How does the utility of malevolent individuals in society count?

# Rawls and Justice as Fairness

- According to John Rawls, we should make our choices from a position separated from arbitrary special interestedness.
  - “Veil of ignorance”: A hypothetical situation in which we can think rationally but for which our particularities of self and economic situation are as yet unknown.
  - Removed out from our vested interests of life, we would come to a general consensus about principles of social justice – “maximin” principle.
- Criticisms:
  - Rawls assumes that each of us behind the veil of ignorance is extremely risk averse.
  - The Rawlsian theory of justice also appears subject to the *bottomless pit argument*.

# Liberalism, Classical and Modern

- o John Locke (1690) emphasizes the rights of the individual to his property and to himself.
- o According to this view, a person enters the state voluntarily, and he is free to choose what he deems best for himself and his family.
  - o The newer version (by Nozick (1974)) implies that government should limit itself to maintaining only the necessary services - the “minimal” state.
- o Criticism:
  - o If we accept the principle that liberties can be traded off to gain certain efficiencies, this raises the question of whether we must accept the libertarian constraint.

# Egalitarian

- o “Egal” – “Equal”
- o This theory proposes “equal” shares in the distribution of a commodity.
  
- o Criticism:
  - o Equal shares of what? → Health? Services?
  - o What criteria to use? → Need? Age?