FOOD INSECURITY IN THE HISTORY OF RELIGION, POLITICAL, AND ECONOMIC THOUGHT

OUTLINE

- Food and Religiosity

- Ancient Greek Experiences – The Problem of Market Power

- Malthusian Growth Pessimism vs. Ricardian Growth Optimism

- The Lewis-Fei-Ranis Model and the Importance of the Green Revolution

- The Giffen Good

- Engel's Law

LEARNING OUTCOMES

- In this module, students will approach food insecurity from different angles
  - The role of food in religion
  - The role of food in political history
  - The role of food in economic history

- Furthermore, students will learn economic models describing the uniqueness of food as a commodity
  - Lewis-Fei-Ranis Model
  - Giffen Good
  - Engel's Law

FOOD AND RELIGIOSITY

Food as a religious symbol:

- Christianity
  - "I am the bread of life. Who comes to me will never go hungry." (John 6:35)
  - "And he took bread, gave thanks and broke it, and gave it to them, saying, "This is my body given for you; do this in remembrance of me." (Luke 22:19)

- Islam
  - "O believers! Eat the clean things which We have provided you and give thanks to Allah, if you worship only Him. He has forbidden you to eat dead meat, blood, the flesh of swine, and that on which any name other than Allah has been invoked; but if someone is compelled by absolute necessity, intending neither to sin nor to transgress, they shall incur no sin. Surely Allah is Forgiving, Merciful." (Holy Quran, 2:172-172)

Similarly, many religions consider fasting a spiritually cleansing experience.

FOOD AND RELIGIOSITY

Famines as punishment

- Christianity
  - "Now there was a famine in the land, and Abram went down to Egypt to live there for a while because the famine was severe." (Genesis 12:10)
  - "For this is what the Sovereign Lord says: How much worse will it be when I send against Jerusalem my four dreadful judgments—sword and famine and wild beasts and plague—to kill its men and their animals!" (Ezekiel 14:21)
  - " [A]nd there before me was a white horse! Its rider held a bow, and he was given a crown, and he rode out as a conqueror bent on conquest" (Revelation 6:2). The second horse is red, and his rider "[…] was given power to take peace from the earth and to make people kill each other" (Revelation 6:4). The third horseman will come on a black horse and "[…] is holding a pair of scales in his hand […]" that symbolize the need for food rationing (Revelation 6:5). A fourth and final horseman "[…] named Death […]," who is riding a pale horse, was "given power […] to kill by sword, famine and plague, and by the wild beasts of the earth" (Revelation 6:8).

FOOD AND RELIGIOSITY

Famines as punishment

- Islam
  - "And Allah puts forward the example of a township, that dwelt secure and well-content: its provision coming to it in abundance from every place, but it denied the favors of Allah. So, Allah made it taste extreme of hunger and fear, because of that which they used to do." (An-Nahl 128)

FOOD AND RELIGIOSITY

Economic Policy in the Bible – Anti-cyclical fiscal policy

- The Pharaoh saw in his dream "seven heads of grain, full and good, growing on a single stalk," but "after them, seven other heads sprouted - withered and thin and scorched by the east wind." Joseph explained to the Pharaoh that his dream means that "seven years of great abundance are coming throughout the land of Egypt, but seven years of famine will follow them." Joseph advised the Pharaoh that Egypt "should collect all the food of these good years that are coming and store up the grain under the authority of Pharaoh, to be kept in the cities for food. This food should be held in reserve for the country, to be used during the seven years of famine that will come upon Egypt, so that the country may not be ruined by the famine." Until today countries follow this advice and keep strategic food reserves.
(Genesis 41:1-40)

# ANCIENT GREEK EXPERIENCES

The Problem of Market Power

- The Greek recognized the uniqueness of food as a commodity and imposed strict regulations for the trade in grains like quotas for traders to avoid speculative purchases and sales.

- Officials failing to stabilize prices and supply, or traders being caught selling more than their assigned quota were sentenced to death.

- "When do they make the biggest profits? When the news of a disaster enables them to sell at high prices. Your misfortunes are so welcome to them that sometimes they hear of them before anyone else, sometimes they invent them." [Lysias, quoted in Spitz (1985:309)]

MALTHUSIAN GROWTH PESSIMISM

Malthus Congestion Hypothesis

- Population will eventually outgrow the available productive capacity. Because agricultural production is subject to diminishing returns, ever less productive land will have to be exploited. Population growth, on the other hand, occurs exponentially.

- Boom and bust cycles are therefore inevitable.
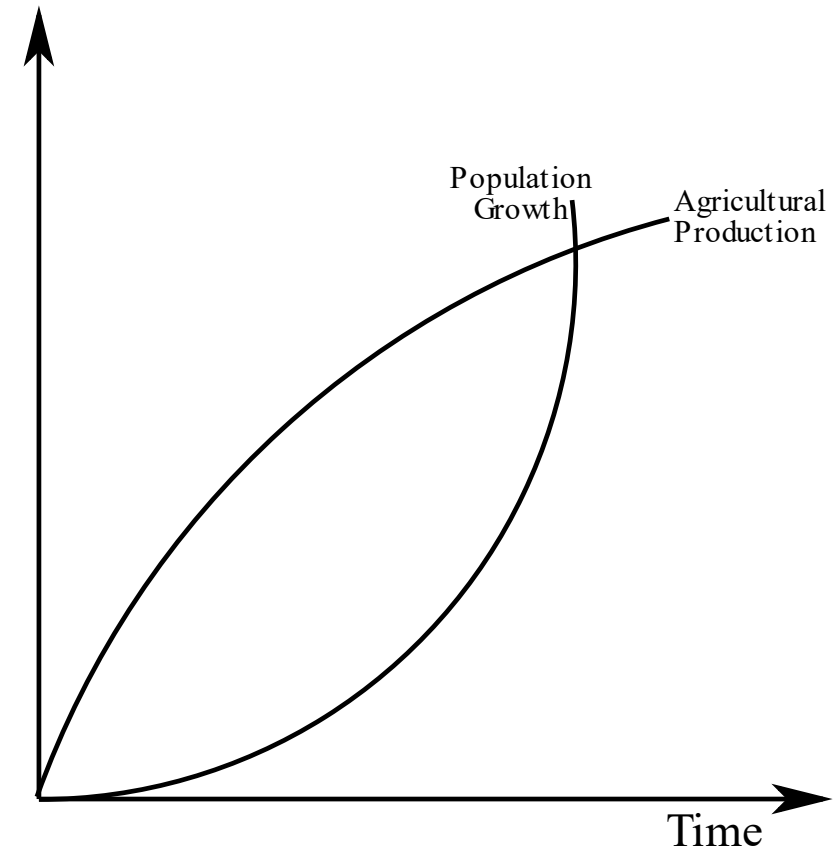
RICARDIAN GROWTH OPTIMISM

Ricardo's Theory of Comparative Advantage

- If countries participate in international trade, all benefit from gains from trade; thus, consuming more than they produce.

- Trade will still occur even if one country has an absolute advantage in all products.
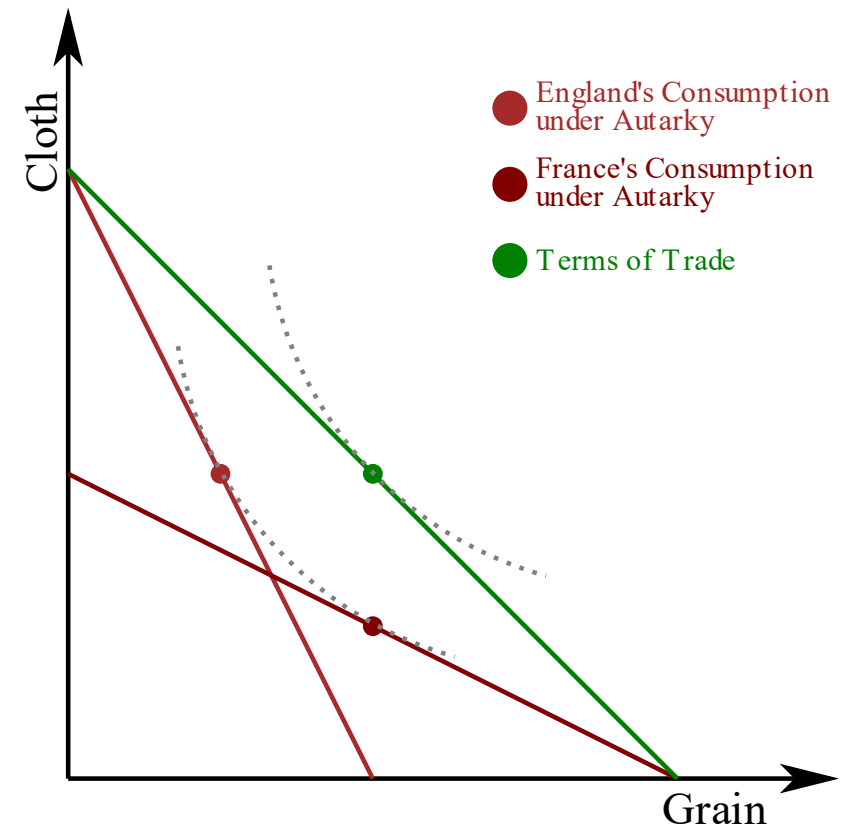
LEWIS-FEI-RANIS MODEL

Green Revolution and Modernization

- In a dual economy, a green revolution frees up excess labor, increases food supply, lowers subsistence wages, and allows for a greater expansion of manufacturing.
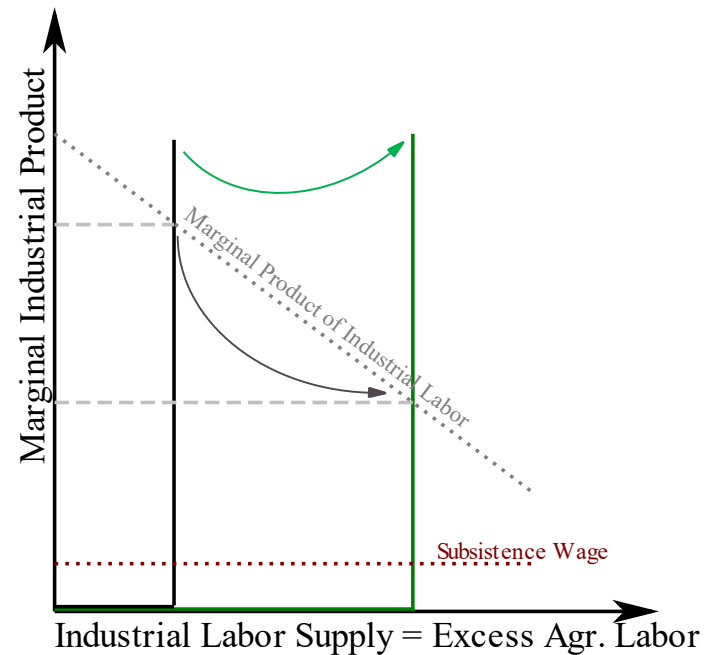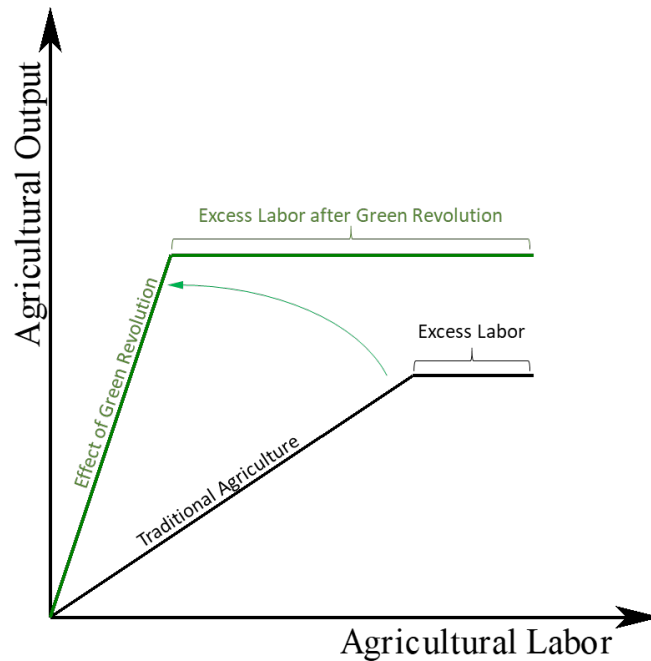
THE GIFFEN GOOD

Definition

- A Giffen good is a product that people consume more of as the price rises and vice versa.

Policy relevance of Giffen Goods

- Adverse effects of cash transfers under the assumption that it would lead to more bread purchases: if bread is a Giffen good, consumers will buy less. Hence, the Giffen effect will undermine public policy effectiveness.

- Adverse effects of subsidizing the price of basic stables like rice under the assumption that it would increase rice consumption: if rice is a Giffen good, consumers will buy less. Again, the Giffen effect will undermine public policy effectiveness.

EXPLAINING GIFFEN BEHAVIOR

- The consumer must be poor, but not extremely poor

- The consumer must not be calorie deprived but operate above the minimum subsistence level

- There must be a point at which extra bread consumption has zero marginal utility
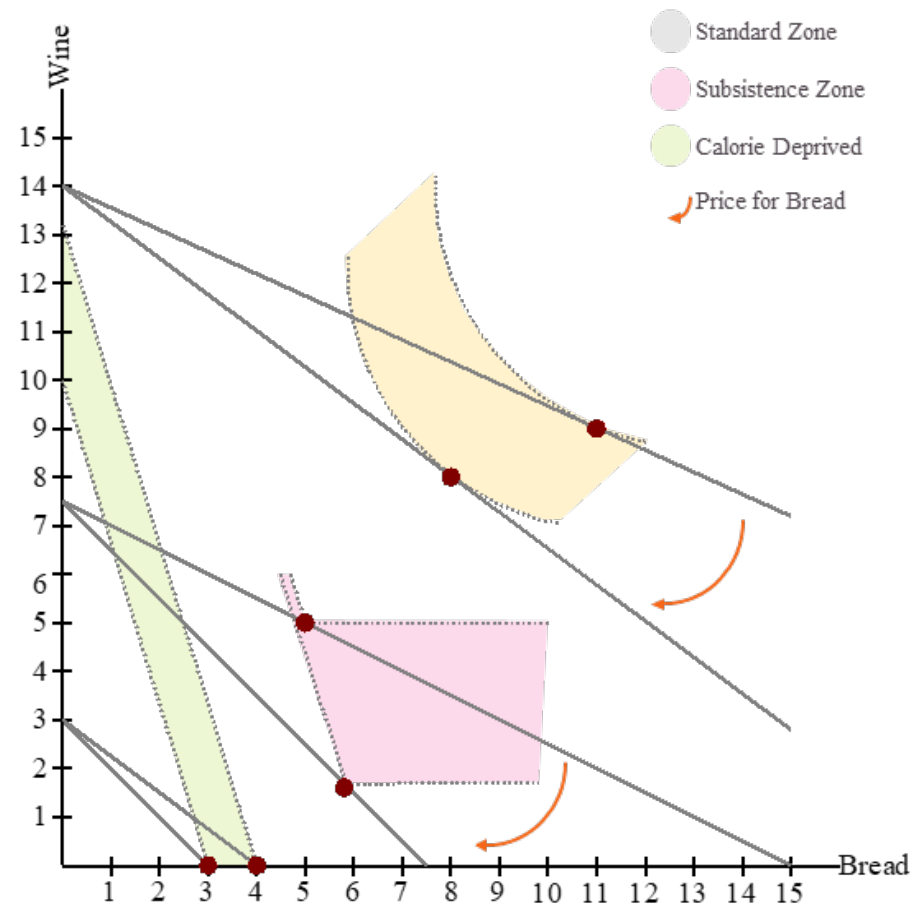
EXPLAINING GIFFEN BEHAVIOR

1. Consider the following consumer choice problem:

- $\min_{B,W}\{\alpha(B+W), W+\beta\}$ s.t. $P_B B + P_W W \leq M$

where

- $B = Bread$

- $W = Wine$

- $\beta > \alpha > 1$

2. Identify the "Kinks"

- $\alpha B + \alpha W = W + \beta$

Rearrange and solve for W

- $W = \frac{\beta - \alpha B}{(\alpha - 1)}$

*For details see Handout

EXPLAINING GIFFEN BEHAVIOR

3. Derive the demand function for bread

Substitute W into the Budget Constraint

- $P_B B + P_W \left[\frac{\beta - \alpha B}{(\alpha - 1)}\right] = M$

And solve for B to get:

- $B = \frac{(\alpha - 1)M - P_W \beta}{(\alpha - 1)P_B - P_W \alpha}$

4. Condition for Giffen effect

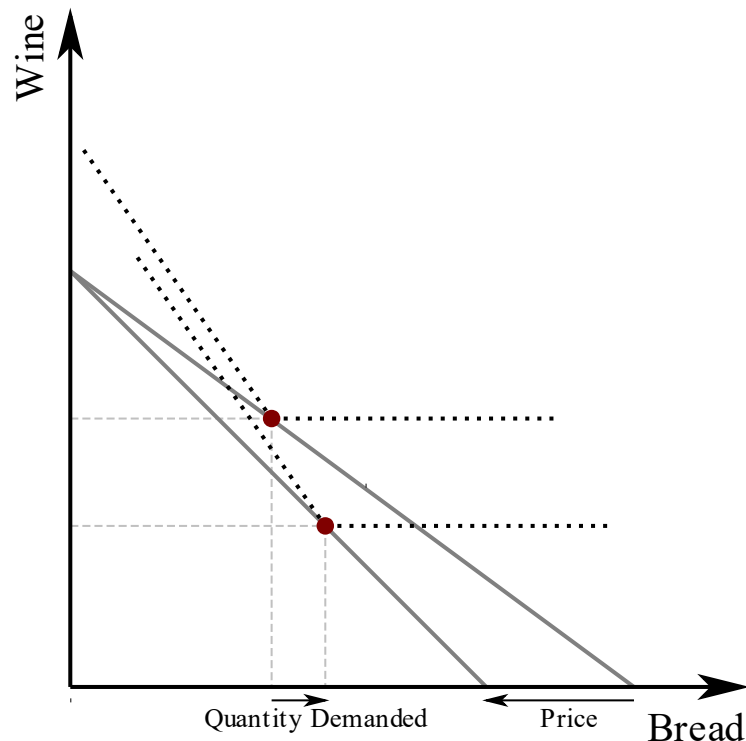- $B = \frac{(\alpha - 1)M - P_W \beta}{(\alpha - 1)P_B - P_W \alpha}$

- $[(\alpha - 1)M - P_W \beta] \times [(\alpha - 1)P_B - P_W \alpha]^{-1}$

- $\boxed{(\alpha - 1)M < \beta P_W}$

*For details see Handout

EXPLAINING GIFFEN BEHAVIOR

Stylized illustration of indifference curves and budget constraints with different prices for Bread

- Assume the price for bread goes up

- Hence, the demand curve for wine and bread rotates inwards

- If bread is a given good, then quantity demanded for bread goes up

ENGEL'S LAW

Definition

- Engel's law is the observation that as household income increases, the share of income spent on food decreases

Policy relevance of Engel's Law

- Because of Engel's observation, poor households are hit harder from rising food prices than households that are better off.

UNDERSTANDING ENGEL'S LAW

Consider the following consumer choice problem

- $\max_{X,Y}(X - \bar{X})^{\propto} Y^{\beta}$ s.t. $P_X X + P_Y Y \leq M$

Where

- $X = food$
- $\bar{X} = min.\, necessary\, consumption\, of\, food$
- $Y = other\, goods$

Find the demand functions for X and Y

Interior Solution that satisfies:

- $P_X X + P_Y Y = M$ (BL)
- $\frac{MU_X}{MU_Y} = \frac{P_X}{P_Y} \cdot \frac{\alpha \bar{Y}}{\beta(X-\bar{X})} = \frac{P_X}{P_Y}$ (ES)

From (ES) get Y:

- $Y = \frac{\beta P_X (X-\bar{X})}{\alpha P_Y}$

Substitute into (BL) and get:

- $P_X X + P_Y \left(\frac{\beta P_X (X-\bar{X})}{\alpha P_Y} \right) = M$

*For details see Handout

UNDERSTANDING ENGEL'S LAW

Find the demand functions for X and Y

- $X^*(P_X, P_Y, M) = \bar{X} + \left(\frac{\alpha}{\alpha+\beta}\right)\frac{M - P_X\bar{X}}{P_X}$

- $Y^*(P_X, P_Y, M) = \left(\frac{\beta}{\alpha+\beta}\right)\frac{M - P_X\bar{X}}{P_Y}$

Share spent on food decreases as income increases

- $RES_X = \frac{P_X X^*}{M} = \frac{P_X}{M}\left[\bar{X} + \left(\frac{\alpha}{\alpha+\beta}\right)\frac{M - P_X\bar{X}}{P_X}\right]$

Simplify

- $RES_X = \frac{P_X\bar{X}}{M} + \frac{\alpha}{(\alpha+\beta)}\left(\frac{M - P_X\bar{X}}{M}\right)$

And show

- $RES_X = \frac{P_X\bar{X}}{M}\left(1 - \frac{\alpha}{(\alpha+\beta)}\right) + \frac{\alpha}{(\alpha+\beta)}$ ↑   ↓

*For details see [Handout](#)

SUMMARY

- The importance of food and food security can be traced back throughout history.

- Food is a unique commodity.

- Economic models attempt to capture the uniqueness of food.
  - Lewis-Fei-Ranis Model
  - Giffen Effect
  - Engel's Law

COMPLEMENTARY MATERIAL

- Mankiw, N. (2017). Principles of Microeconomics. Cengage Learning.
  - Comparative Advantage ch.3

- Nafziger, E. (2012). Economic Development. Cambridge.
  - The Lewis-Fei-Ranis Model p. 133ff

- Hansen, H. O. (2013). Food Economics: Industry and Markets. Routledge.
  - Engel's Law p.183ff
  - Giffen goods p. 191f

SELF-ASSESSMENT

- True or False Questions
- Multiple Choice Questions
- Cloze Questions

EXERCISE MODULES 4 & 5

- Consider an individual that maximizes
  - Cobb-Douglas Utility Function $\max U(x,y) = x^\alpha y^\beta \ \ s.t. \ M = P_x x + P_y y.$
  - Stone-Geary Utility Function $\max U(x,y) = (x - \bar{x})^\alpha (y - \bar{y})^\beta \ \ s.t. \ M = P_x x + P_y y$
  - Leontief utility function $\min U(U_1, U_2) = \min(\gamma x, y) \ \ s.t. \ M = P_x x + P_y y$
  - modified Leontief utility function $minU(U_1, U_2) = [\alpha(B + W), W + \beta]$ $s.t. \ M = P_x x + P_y y \ \ with \ b{>}a{>}1$

- For each of the above
  - Derive the Marshallian demand function for x and y (B and W).
  - Sketch a stylized indifference curve and budget constraint in the optimum.
  - Derive the relative expenditure share functions for x and y (B and W).
  - What kind of consumer behavior does the consumer choice problem describe?

Understanding and Managing Food Insecurity

SOURCES

Hansen, H. O. (2013). Food Economics: Industry and Markets. Routledge.

Mankiw, N. (2017). Principles of Microeconomics. Cengage Learning.

Nafziger, E. (2012). Economic Development. Cambridge.

Spitz, P. (1985). The right to food in historical perspective. Food Policy, 10(4), 306-316.