Chapter Two
Decelerating agricultural society: Theoretical and historical perspectives

Economic Growth: The New Perspectives for Theory and Policy

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2.1 Look at the definition and characteristics of agricultural societies.

2.2 Look at the theories for decelerating society.

2.3 Look at theoretical explanations about the rise of an agricultural society and its deceleration patterns.

2.4 Look at the growth limitations of a decelerating agricultural society.

2.5 Look at the deceleration of an agricultural society and its replacement by an industrial society in Europe and the United States.

2.6 Look at the transition periods from the decelerating agricultural to accelerating commercial societies.

2.7 Summary

2.8 References
Definition of an agricultural society

Key indicators to define an agricultural society:

- Self-sufficiency
- A community with natural interdependency
- Key production factor: land
- In Europe: Manor was the heart of the agricultural district
Characteristics of an agricultural society

An agricultural society’s short-term production function follows the neo-classical production function function (van Bath, 1963):

- Diminishing returns to scale
- \( Y = F(\text{Land, Labor}) \)

Affected by regional and economic factors:

- Climate, quality of soil, and the condition of the agricultural water supply
- Recovering fertility of soil after land usage
- Ratio of the quantity of sown seeds to harvest
- Low technology development
Characteristics of an agricultural society

Figure 2-1

Divergence patterns of purchasing power per head of milk cows and other cattle, 1875 to 1937

Due to the inelasticity of demand and supply, the characteristics of agricultural products may cause large price fluctuations.

Source: M. Ezekiel, The cobweb theorem, Quarterly Journal of Economics 52 (2) (1938) 255–280
2-2 Theory of decelerating society

Viewpoint of neo-classical technical change

Figure 2 – 2A

Relationship between output and time as seen by shifts in APFs (Aggregate Production Functions) over time in an agricultural society

Each APF reflects the technology level at a specific time. In a pure agricultural society, the degree of shift in APF is small and decreasing over time.
2-2 Theory of decelerating society

Viewpoint of neo-classical technical change

Figure 2 – 2B

Relationship between output and time of an agricultural society as seen through a production expansion path

The growth rate of agricultural society is decelerating because the annual growth of production is gradually decreasing over time due to sluggish technology advancement.
2-2 Theory of decelerating society

Viewpoint of induced innovation model (Hayami and Ruttan)

- Figure 2 - 3

Relationship in an agricultural society between output and time per the induced innovation model

The meta-production function for agriculture also shows that the economic growth rate decreases as the movement of the short-run production function gets smaller due to slow technology development.
Debertin’s explanation of agricultural production

General forms of the neo-classical production functions

In the case of agricultural production, productivity drops quickly because the rate of production factor, which is a fixed cost, is high and the production period is long (Debertin, 1986).
Johnston and Mellor’s stage theory of agricultural development

1\textsuperscript{st} stage: development of agricultural preconditions

2\textsuperscript{nd} stage: expansion of agricultural production based on labor-intensive techniques that rely heavily on technological innovations

3\textsuperscript{rd} stage: expansion of agricultural production based on capital-intensive and labor-saving techniques
2-3 Theoretical explanations about a decelerating agricultural society

Hayami and Ruttan’s agricultural development theory

Technology innovation is the most important factor for agricultural development.

The long-term trend of agricultural production is expressed by the meta-production function.

- An envelope of short-term production functions for the period
- The change between short-term production functions in successive periods is regarded as technology advancement

The shape of meta-production functions for a pure agricultural society shows a decelerating form according to time because technology innovation is very slow.
Limitations of a decelerating agricultural society

Scale-related structure problem

The self-sufficient structure and the lack of economies of scale result in an inability to sustain capital accumulations in a pure agricultural society (Olmstead and Rhode, 1993) to develop an economy continuously.

Figure 2 - 5
The structure of a decelerating society

The traditional society inevitably experienced a growth ceiling because of the low productivity resulting from lack of modern technologies (Rostow, 1960):

- According to the stages of economic growth hypothesis, the transition from an agricultural to an industrial economy moves the society to a more developed state.
- Movement of productive resources from agriculture to industry promotes economic growth (Johnston and Mellor, 1961).
Market-related structure problem

Production of organic matters and mechanization of agricultural production are difficult to adjust quickly in response to changes in market conditions, and the supply is therefore inelastic in product or price dimensions.

The relative importance of agricultural production decreases as the economy grows, because income elasticity of agricultural products is less than that of industrial products (Schultz, 1953).

Equilibrium theory (Kelley, Williamson, and Cheetham, 1972; Yamaguchi and Binswanger, 1975):

- Constraint of demand, which is attributed to low income elasticity, acts as the fundamental limit of agricultural growth.
Institution-related structure problem of a post-agricultural society

Agricultural development is confined by country-specific institutional conditions:

- Colonial period
- Taxation, regulation, property rights, institutions, and natural environments of each country
- Public subsidies (antitrust law exemptions in the agricultural sector during the 1920s agricultural crisis by US government)

Mundlak (2000) claimed that agricultural development should be investigated not only within the sector but also in the context of the general economy.
Position of agriculture within the economic development theory

According to economic development theory, an agriculture society is always the precondition for industrialization:

- Marx’s economic development theory
- List’s four stages theory
- Fisher and Clark’s structural change theory
- Rostow’s leading industry theory
Agricultural production of medieval European countries

**Figure 2 - 6**

*Agricultural output per capita, 1300-1800 (England in 1500 = 1.00)*

The agricultural productivity per laborer was sluggish or decreasing during the Middle Ages except in England and the Netherlands.

Agricultural production of Italy:

Figure 2 - 7

*Gross agricultural product in Cuneo Italy, 1300-1870 (1860-70=100)*

The agricultural production remained sluggish until 1820, just before Italy became an industrial society.

Total crop production of medieval England:

Figure 2 - 8

*Grain output at constant consumption per output, England, 1541-1860*

The Industrial Revolution helped agricultural production escape a decelerating trend.

Source: G. Clark, Yields per acre in English agriculture, 1250–1860: evidence from labour inputs, Economic History Review 44(3) (1991) 445–460
Historical perspectives on countries experiencing a decelerating agricultural society

Agricultural productivity of the United States of America:

Three sub-periods until 1930 experienced decelerating growth. However, after the development of industrial technologies, the accelerating growth started to emerge.

Formation of a commercial society:

The commercial society appeared in Europe around the 14th century with the increase of agricultural output and vigorous commercial activities to exchange surplus:

- Equipment and technologies related to agriculture continued to be developed.
- The agricultural output grew.
- Commerce was initiated through the surplus supply of agricultural products.
- Demand for imported spices and luxuries increased.

The commercial society adds value by transporting the value created by the agricultural society to the places where consumer utility is highest.
Development of a commercial society:

The commercial society overwhelmed medieval European agricultural society via enlarged cities, increased population, and expanded market activities.

The market was activated through the trade of agricultural surplus and the inflow of population to the cities.
## Table 2.1 Estimated population distribution, 1300-1800 (millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Urban</th>
<th>Rural non-agricultural</th>
<th>Rural agricultural</th>
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### Table 2.1 Estimated population distribution, 1500-1800 (millions)

<table>
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## Development of a commercial society, Italy

<table>
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<th>Rural agricultural</th>
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Development of a commercial society

Figure 2-10

Development of commerce and exchange between regions

The lines show flow of goods between two destinations. Active cultural exchange is another factor that promotes a commercial society.

Limitations of a commercial society

The accelerating development of growth in a commercial society is limited because the basis for value creation in the commercial society is agriculture.

Figure 2 - 11

Relationship between output and time in an accelerating commercial society
Limitations of a commercial society

The numbers of items or traded products was not enough for sustaining acceleration. Commercial societies (Netherlands) went into ruin with the advent of the industrial society (England).
### Limitations of a commercial society

#### Table 2.2 Spain (Castile) debt, 1515-1667

<table>
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<th>Interest</th>
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<tr>
<td>1667</td>
<td>130</td>
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</table>

Limitations of a commercial society

Spain was basically an agricultural society mainly involved in merchant trading.

Figure 2 - 13
Spain’s wool exportation trend, 1540-1780

Limitations of a commercial society

England started to accumulate wealth by gradually substituting wool with processed goods, which yielded a higher value-added price.


Figure 2 – 14A

Raw wool exports of England, 1349-1540
Limitations of a commercial society

**Figure 2 – 14B**

*Woolen clothes exports of England, 1349-1540*

England, by producing various products besides woolen cloths such as steel, zinc, silk, and glass among others, became strong. The development of industry ushered in the Industrial Revolution.

Limitations of a commercial society, 1530-1619

Table 2.3  Melting furnace and steel production of England, 1530–1709

<table>
<thead>
<tr>
<th>Year</th>
<th>No. of melting furnaces</th>
<th>Avg. production per melting furnace (ton)</th>
<th>Total production (1,000 ton)</th>
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<tbody>
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<td>1610-1619</td>
<td>79</td>
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Limitations of a commercial society, 1620-1709

<table>
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<td>1620-1629</td>
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<td>230</td>
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Limitations of a commercial society, 1530-1709

Melting furnace and steel production of England, 1530–1709

- No. of melting furnaces
- Avg. production per melting furnace (ton)
- Total production (1,000 ton)
Limitations of a commercial society

Figure 2 – 15A

**GDP per capita in England, 1500-1820**

GDP per capita of England, which was successfully industrialized, was growing at an accelerated rate from 1500 to 1820.

Source: Pamuk (2008)
Limitations of a commercial society

GDP per capita of Spain and Italy, which had remained in commercial societies, had stagnated.

Figure 2 – 15B

GDP per capita in Italy and Spain, 1500-1820

Source: Pamuk (2008)
2-7 Summary

• Agricultural societies have maintained a self-sufficient level of economic activities without any particular technological advancement.

• Also the agricultural society has a structural limit: All surplus values are used for the maintenance of the status quo and not for the reinvestment of surplus production.

• Therefore, the historical, general, and economic growth trends of the agricultural society show a gradual decrease in the development rate over time in terms of agricultural output and productivity.

• The commercial society started to accumulate capital by generating new demand through trade. However, without development of new products to support this process continuously, expansive reinvestment of capital from the merchant trade cannot maintain the accelerated growth pattern.

• Commercial countries that pursued economic development by trade were outrun by the industrial countries that developed new products by technology innovation.
2-8 References


2-8 References


2-8 References


2-8 References


- Schultz, T.W. (1964), Transforming traditional agriculture, Yale University Press, New Haven, CT.


2-8 References


- van Bath, B.S. (1963), The agrarian history of Western Europe, AD 500-1850, Edward Arnold, London.


