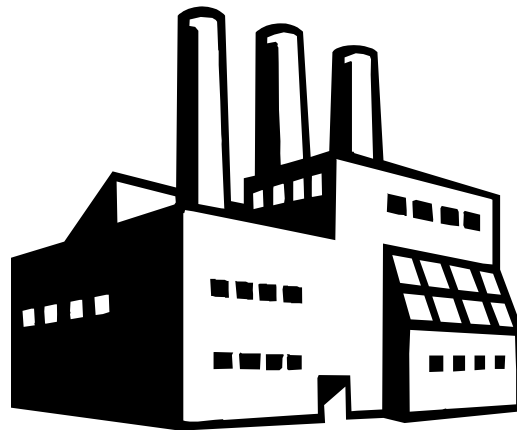
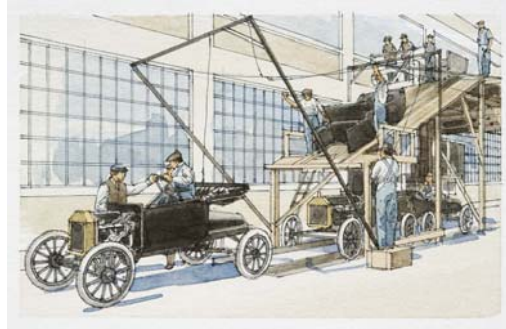
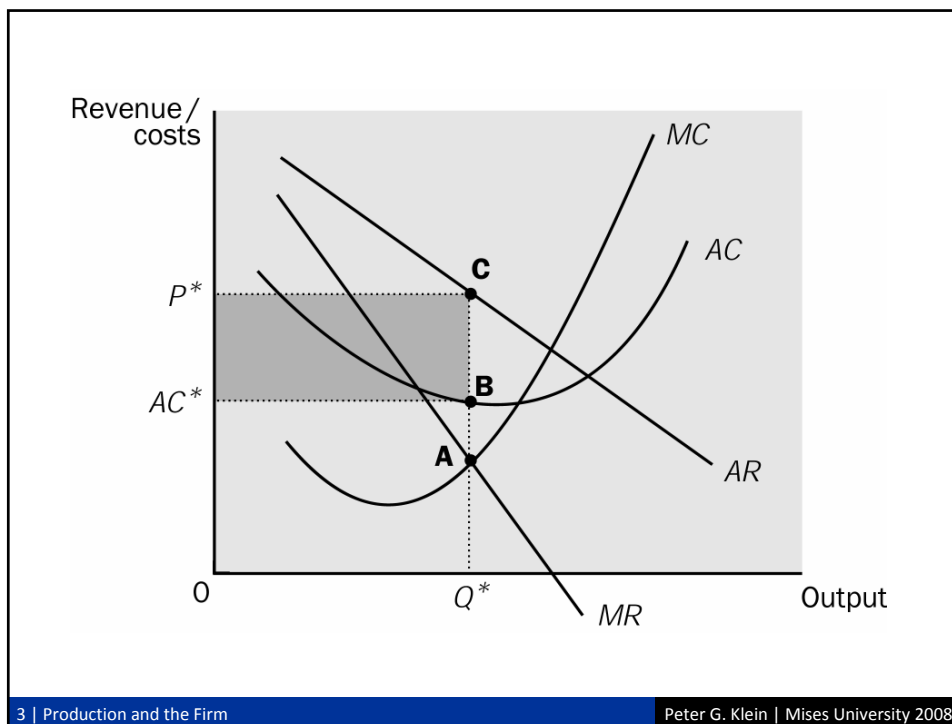


Production and the Firm

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July 2008





Suppose we are considering a firm that produces only one output. In this case we write the net output bundle as $(y, -\mathbf{x})$ where \mathbf{x} is a vector of inputs that can produce y units of output. We can then define a special case of a restricted production possibilities set, the **input requirement set**:

$$V(y) = \{\mathbf{x} \text{ in } \mathbb{R}_+^n : (y, -\mathbf{x}) \text{ is in } Y\}$$

The input requirement set is the set of all input bundles that produce *at least* y units of output.

Note that the input requirement set, as defined here, measures inputs as positive numbers rather than negative numbers as used in the production possibilities set.

The Austrian approach to production and the firm

► Basic elements

- Inputs (land, labor, capital) and outputs
- Prices
- Profits and losses
- Time and uncertainty
- The entrepreneur
 - Economic calculation



► General approach: causal-realist

- Begins with concepts of means and ends — teleological, not mechanistic
- Seeks to explain prices, quantities, and characteristics of real goods and services produced and exchanged in real markets, not hypothetical goods and hypothetical markets

Two aspects of the “theory of the firm”

► Theory of production

- The structure of production
- Factor pricing
- The entrepreneur’s costs

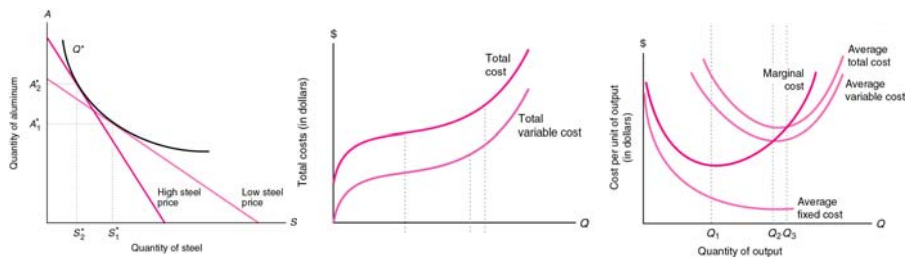
► Theory of the firm

- Why do entrepreneurs establish firms?
- What determines the size and scope of the firm?
- How should firms be organized and managed?



Neoclassical production theory

- ▶ Take factor and output prices as given, solve for profit-maximizing level of output.
- ▶ Extensions: downward-sloping demand curves, price discrimination, multiple products, strategic interaction
- ▶ Problems: no time or uncertainty; no causal explanation for factor prices; emphasis on the wrong problems



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Austrian production theory

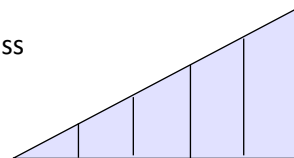
▶ Sources

- Menger, Böhm-Bawerk, Mises, Hayek
- Rothbard, *Man, Economy, and State*, chapters 5–9
- Lachmann, *Capital and Its Structure* (1952)



▶ Key issues

- Factor pricing and factor use (structure of production)
- Entrepreneurial profit and loss



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Factor pricing

- ▶ Factors of production: land, labor (including management), capital goods
- ▶ Austrian theory of **imputation**
 - Rental prices of (nonspecific, isolable) factors (used in variable proportions) tend to equal their **discounted marginal revenue products** (DMRPs).
 - Rental prices of other factors set by bargaining between resource owners and entrepreneurs.

Calculating DMRP and long-run equilibrium price

- ▶ Variable proportions (isolable factors):
$$4A + 10B + 2C \rightarrow \$100$$
$$3A + 10B + 2C \rightarrow \$80$$
$$\text{MRP}(A) = \$20$$
$$P(A) = \$20$$
- ▶ Fixed proportions (non-isolable factors):
$$4A + 10B + 2C \rightarrow \$100$$
$$3A + 7.5B + 1.5C \rightarrow \$75$$
$$\text{MRP}(A) = \$25$$
$$P(A) = \text{no more than } \$25$$
- ▶ An indispensable (non-isolable) factor:
$$1A + 2B + 3C \rightarrow \$200$$
$$0A + 2B + 3C \rightarrow \$0$$
$$\text{MRP}(A) = \$200$$
$$P(A) = \text{no more than } \$200$$

- The adding-up problem
 - The \$20,000 steering wheel

Imputation

- ▶ Classical view: costs determine prices
- ▶ Austrian view: prices determine costs
 - All costs are opportunity costs.
 - Factor prices tend to equal their DMRPs (marginal productivity theory).
 - Factors tend to be allocated to their highest-valued uses in production.
 - The purchase price of a capital asset will tend to equal the sum of its future DMRPs.



Entrepreneurship, profit, and loss

- ▶ In the evenly rotating economy (ERE)
 - Factors (including management) earn their DMRPs.
 - Capitalists earn interest (reward for forgoing current consumption).
 - No profits and losses!
- ▶ Outside the ERE
 - Entrepreneurs earn profits and losses based on anticipations of future prices (Knight, 1921).



The firm as an organization

- ▶ Neoclassical view: firm as production function
- ▶ Agency-theoretic view: firm as a nexus of contracts
- ▶ Property-rights view: firm as ownership of assets
 - The firm is the capitalist-entrepreneur (or a group of capitalist-entrepreneurs) plus the alienable assets he owns.
 - Ownership conveys authority (taxis and cosmos)
 - Firms can own many, or no, production processes.

The theory of the firm

- ▶ Why do firms exist?
 - Transaction costs of market exchange (Coase 1937)
 - Entrepreneurial judgment is non-contractible (Knight, 1921)
- ▶ What determines the boundary of the firm?
 - Internal and external transaction costs
 - Entrepreneurial talent
 - Need for economic calculation (Rothbard)
- ▶ How should the firm be organized?
 - Costs and benefits of delegation (Foss, Foss, and Klein, 2007)

The limits to the firm

- ▶ Incremental limits: indivisibility in the decision-making factor
- ▶ Ultimate limit: need for external markets for all internally transferred factors
 - The vertical stages of production
 - Divisional profit and loss
 - Need for market-based transfer prices
- ▶ Calculational chaos
 - As external markets disappear, “islands of noncalculable chaos swell to the proportions of masses and continents. As the area of incalculability increases, the degrees of irrationality, misallocation, loss, impoverishment, etc., become greater” (p. 548).
- ▶ Relationship to socialist calculation debate

Firm boundaries and internal organization

▶ The Coasian “transaction cost” framework

In a free market, any advantages that may be derived from “central planning” . . . are purchased at the price of an enhanced knowledge problem. We may expect firms to spontaneously expand to the point where additional advantages of “central” planning are just offset by the incremental knowledge difficulties that stem from dispersed information.

— Kirzner, *The Meaning of Market Process* (1992), p. 162

Coase pointed out that there are diminishing benefits and increasing costs to each of these two alternatives, resulting, as he put it, in an “optimum” amount of planning” in the free market system. Our thesis adds that the costs of internal corporate planning become prohibitive as soon as markets for capital goods begin to disappear, so that the free-market optimum will always stop well short not only of One Big Firm throughout the world market but also of any disappearance of specific markets and hence of economic calculation in that product or resource.

— Rothbard, “Ludwig von Mises and Economic Calculation Under Socialism” (1976), p. 76.

Firm boundaries and internal organization II

- ▶ Asset ownership gives authority (right to determine use of asset in situations not specified by prior agreement).
- ▶ Implies limits to delegation
 - Entrepreneurship (exercised through asset ownership) as the “decision making factor” (Rothbard, 1962)
 - Mises (1949) on “playing market”
 - Challenge of credible delegation (Williamson’s “impossibility of selective intervention”)
- ▶ Authority is valuable
 - Need for urgent coordination
 - Possibility of decisive information
 - Scale economies in decision making
 - Controlling agency problems

Takeaways

- ▶ Austrian economics offers a unique theory of production, not merely a verbal rendition of neoclassical production theory.
 - Causal, realistic analysis of factor pricing and use
 - Grounded in marginal utility theory
 - Emphasis on economic, not technological, aspects of production
- ▶ Much remains to be done in this area.
 - Rent theory, internal organization of the firm, microeconomics of business cycles, critique of neoclassical cost-curve analysis, more. . . .