

# Lecture No. 19: Production Strategy

1. What Is Production Strategy?
2. Constituent of Production Strategy
3. Thoughts on Production Strategy

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# 1. What Is Production Strategy?

## **Business strategy**

**Corporate strategy** (company-wide strategy)

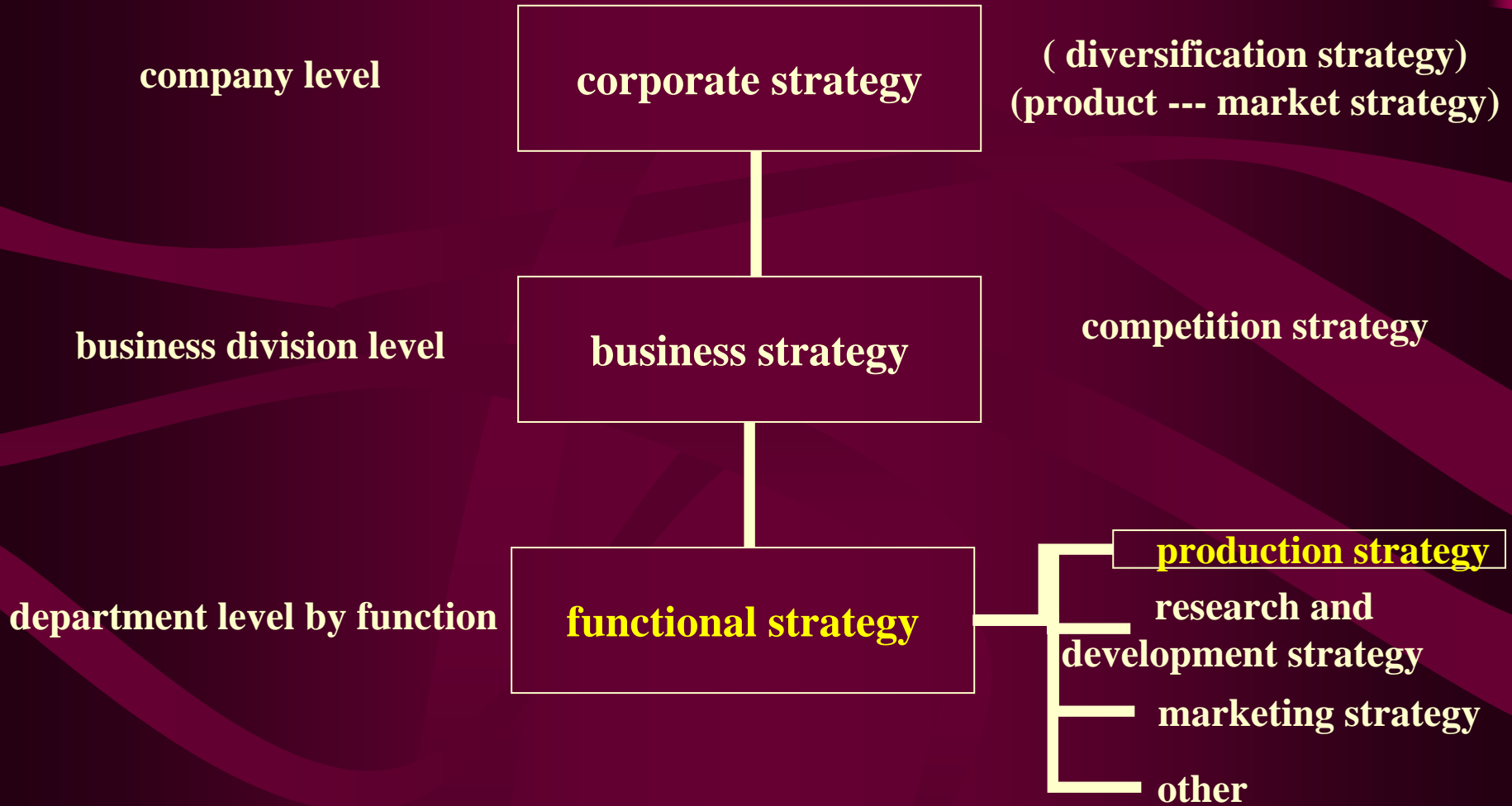
**Business strategy** (competitive strategy)

**Functional strategy** (production, marketing, technology, etc.)

## **Manufacturing strategy**

--- pattern of decision making with certain consistency regarding to production (consistency on maintenance/enhancement of competitiveness)

# Hierarchy Structure of Management Strategy



## 2. Constituent of Production Strategy

### (1) Structural item (hard)

Requiring large investment decision, involving determination by top management

### (2) Substructural item (soft)

Steady **buildup** of small decisions

Gradually formed as action pattern of all employees

Investment in corporate **knowledge/information asset**  
(**intangible**)

# Constituent of Production Strategy

## Structural (hard)

decision of production capacity

factory net work/design

selection of production technology

vertical integration

## Substructural (soft)

personnel/labor management

purchase/supplier management

production plan/control

quality control

costing, IE, improvement

management organization

# Concept of "Strategy": Plan and Pattern

## Strategy as **plan** (vision)

'---- strategy as "what top management says"

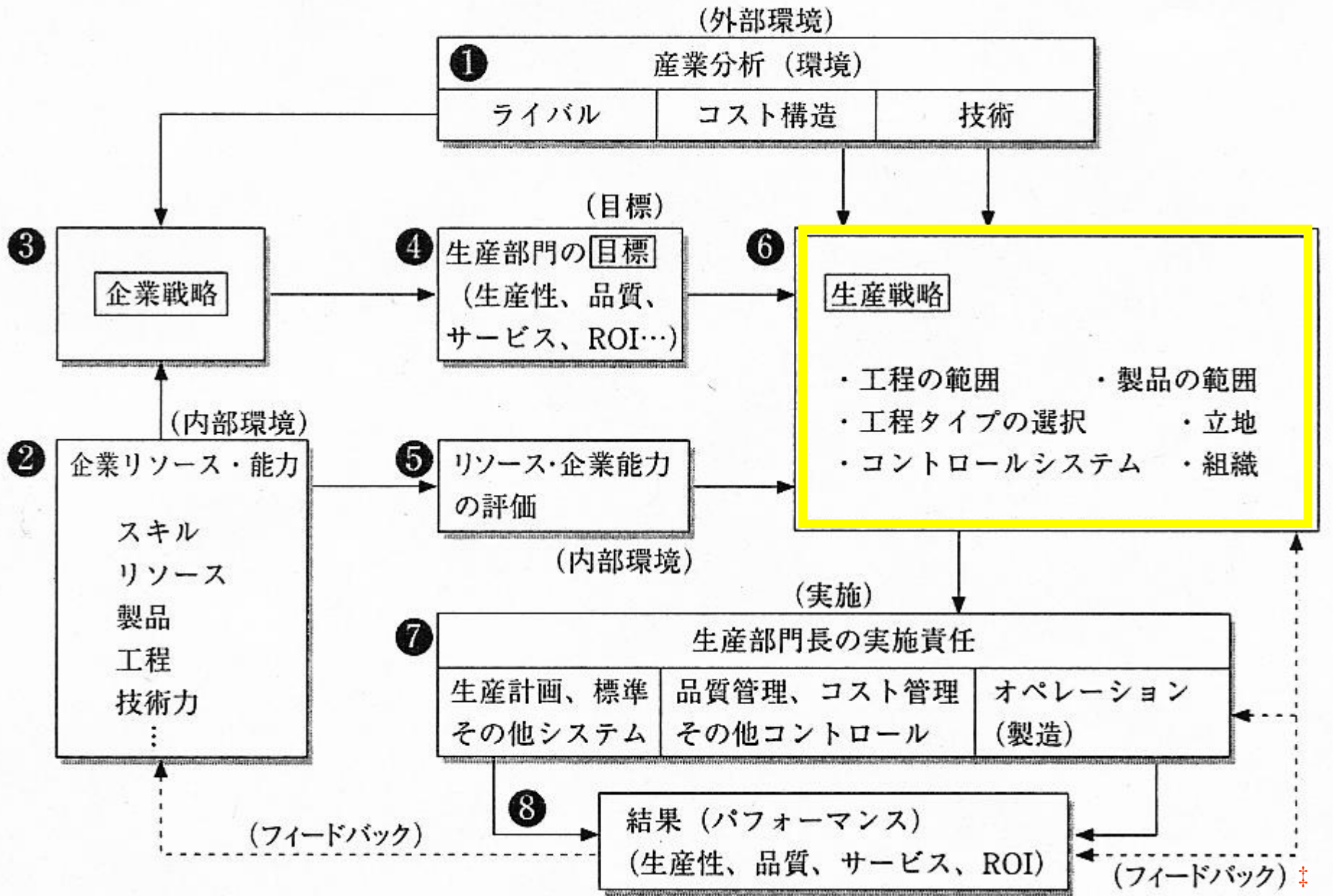
## Strategy as **pattern** (action pattern)

'---- including "quiet man of action"

total production system with consistency on competition

--- which by itself is a "strategy as pattern".

# Steps of Establishing Production Strategy



# Structural Production Strategy (1): Decision of Production Capacity

Expansion of **production capacity**: 2 functions

(1) to fill product customer's demand for product

(2) signal effect

(superiority for first-come; believability in  
intimidation; sunk cost)

**Lumpiness** of capital investment

→

priority investment type

lagging investment type

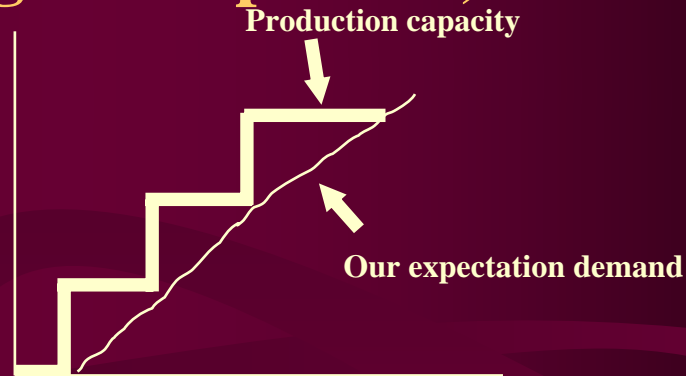
in-balance type (application of critical  
fracture)



# Types of Production Capacity Expansion Strategy (demand growth period)

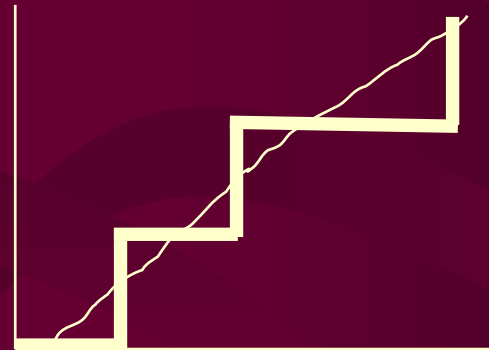
## 1. Priority investment type

- low out-of-stock cost
- quick delivery
- easy share increase
- low capacity-operating rate



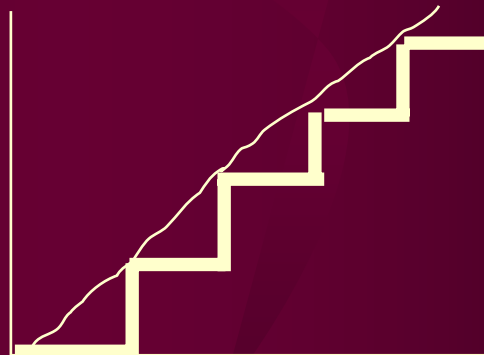
## 2. In-balance type

mid point between 1 and 3



## 3. Lagging investment type

- high out-of-stock cost
- prone to late delivery
- risk of share decrease
- high capacity-operating rate



# **Structural Production Strategy (2): Factory Network Strategy**

## **(1) Factory scale and number of factories** **Optimum scale of factory**

**economics of scale** (short term, medium term,  
long term, dynamic)

**vs.**

**diseconomics of scale**

**transportation cost**

**recruitment cost**

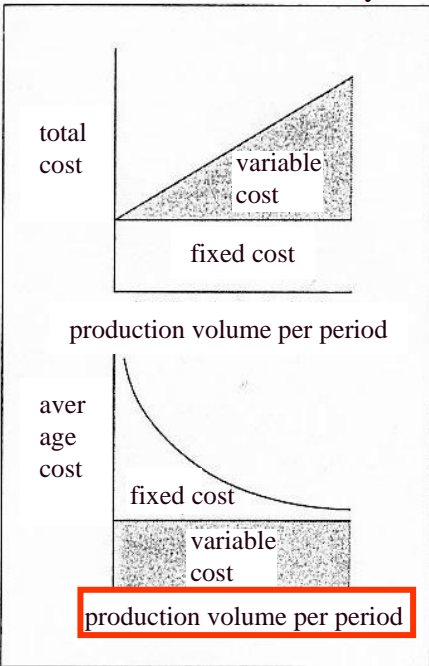
**organizational rigidification**

**confusion in production**

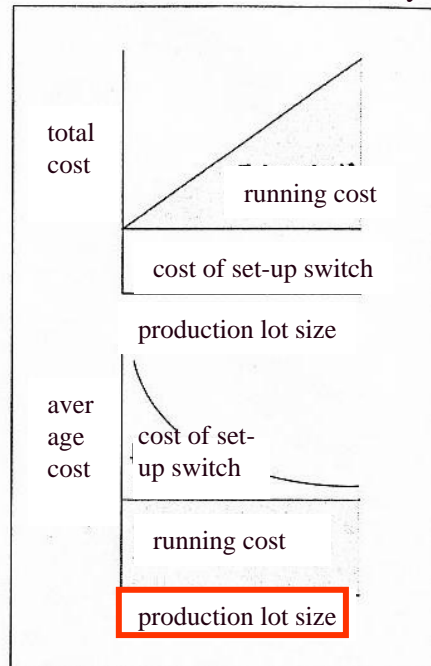
**risk of concentrated production**

## Economics of Scale (scale economy)

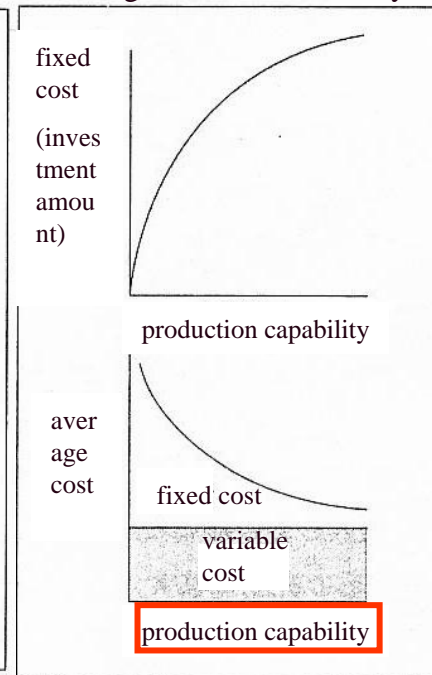
1 short-term scale economy



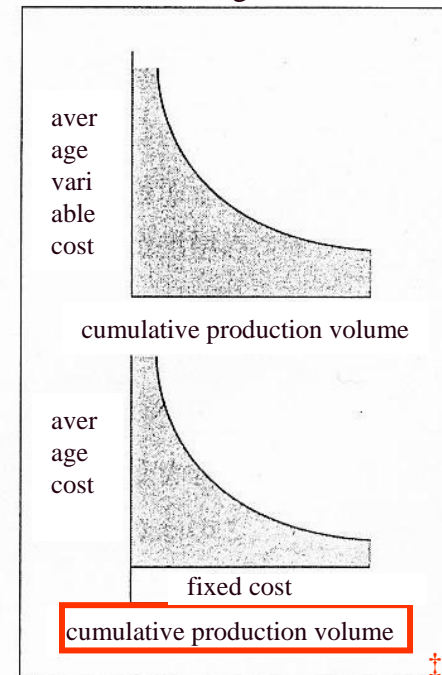
2 medium-term scale economy



3 long-term scale economy



4 learning effect



# Concept of Optimum Factory Size (Sherer)

average

optimum factory size

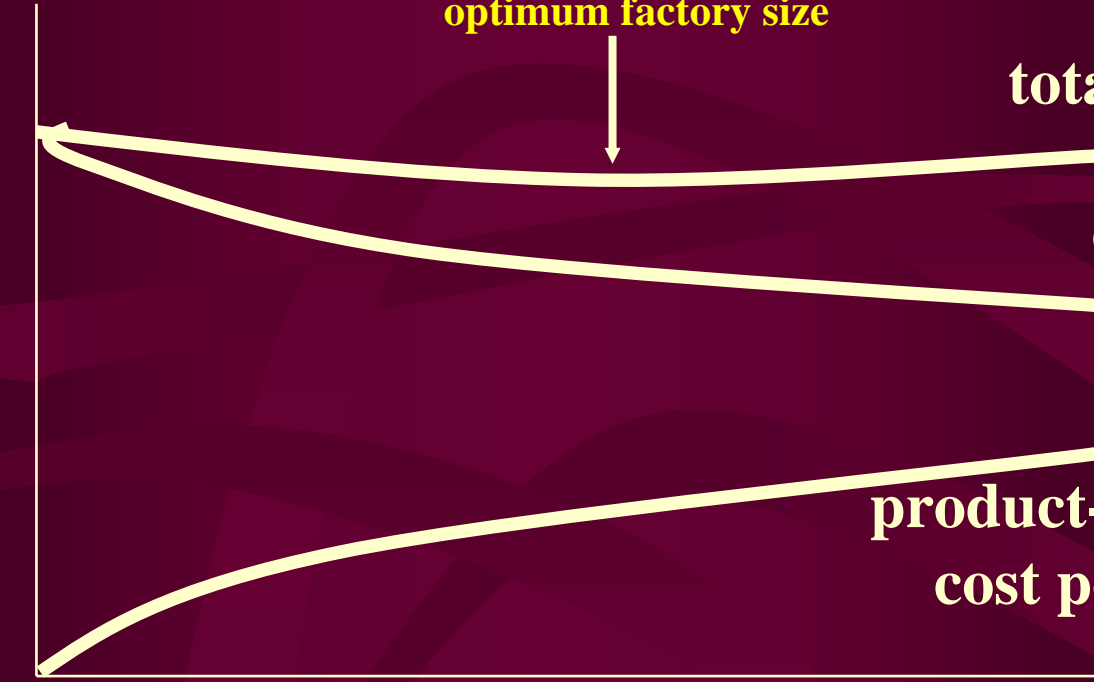
total cost per unit

cost per unit  
in long term

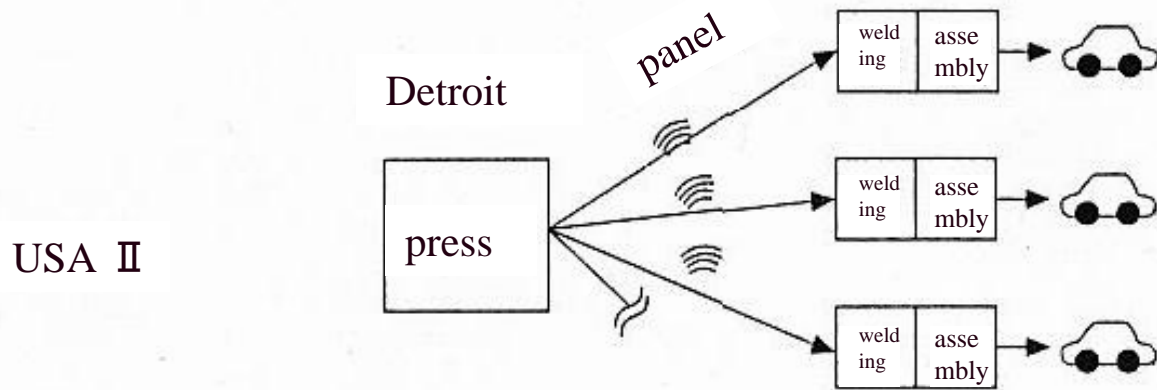
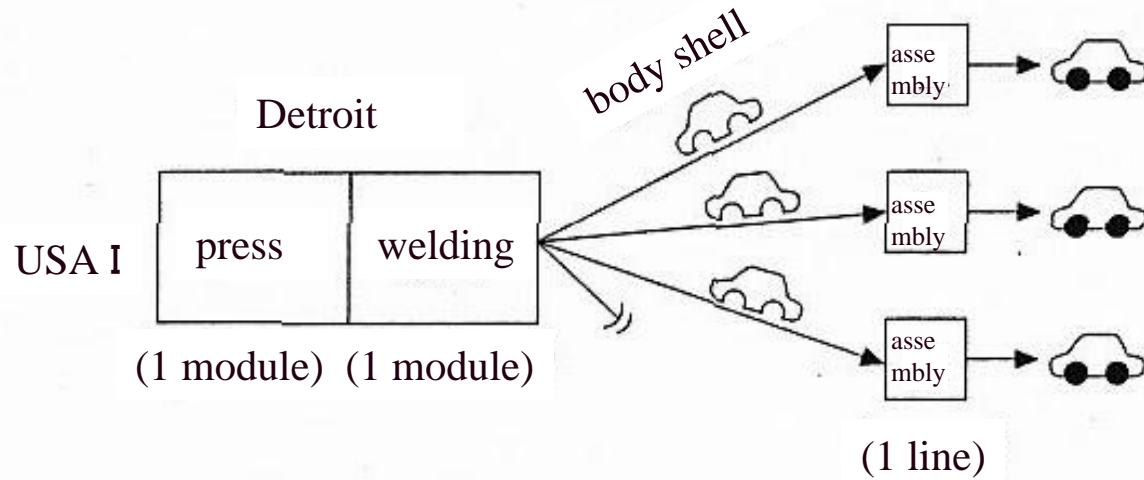
product-transportation  
cost per unit

factory size

0



# Factory Network of Press-to-Assembly System



## (2) Factory Location

**Factory location research --- in parallel to new factory plan/business plan**

### **Check points:**

distribution of consumption market/material maker,  
local labor market

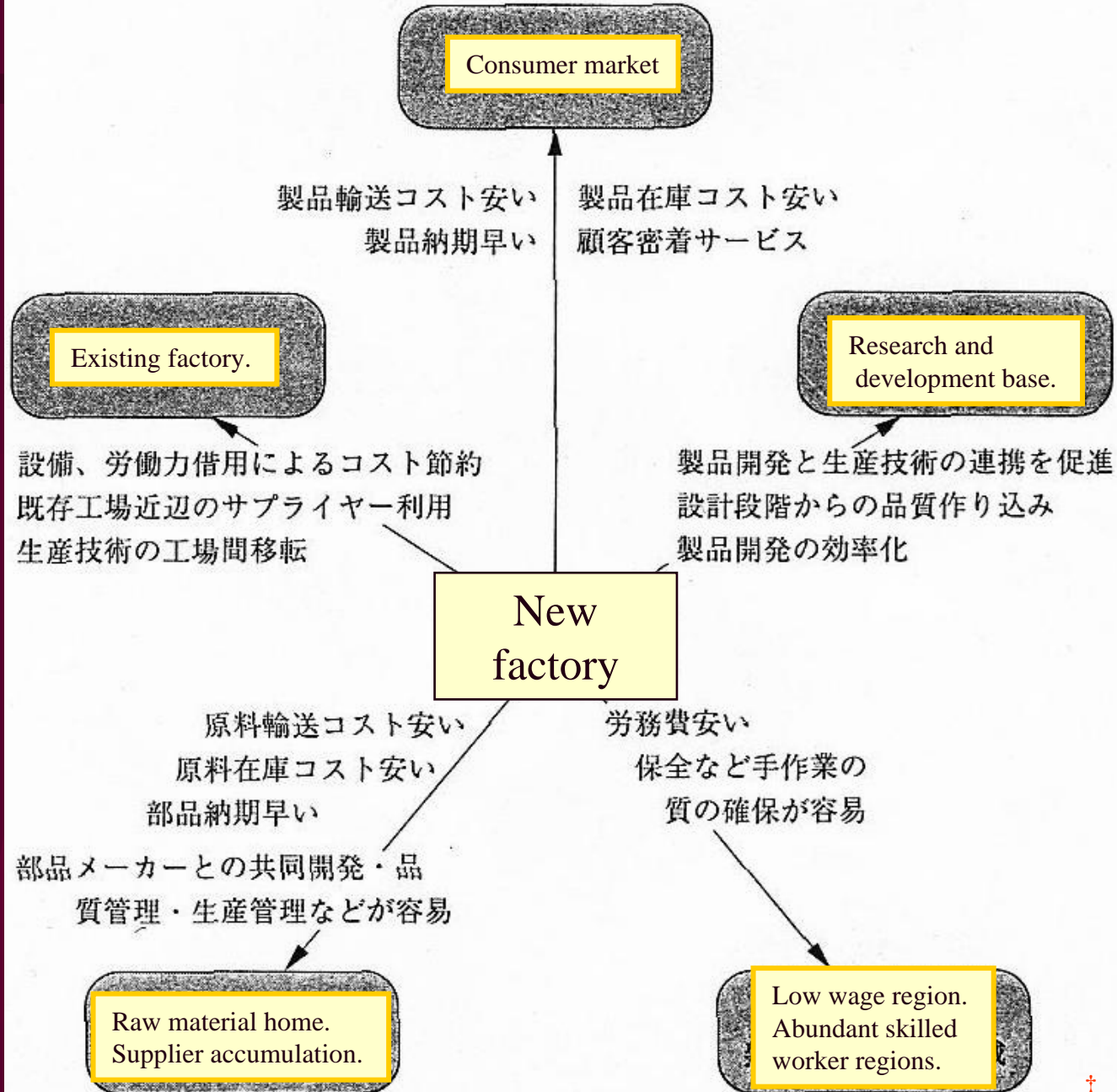
transportation method, community, utility  
environment, preferential measure of local  
government, and others

Country → area → local → property

Location strategy of new factory (refer to the diagram)

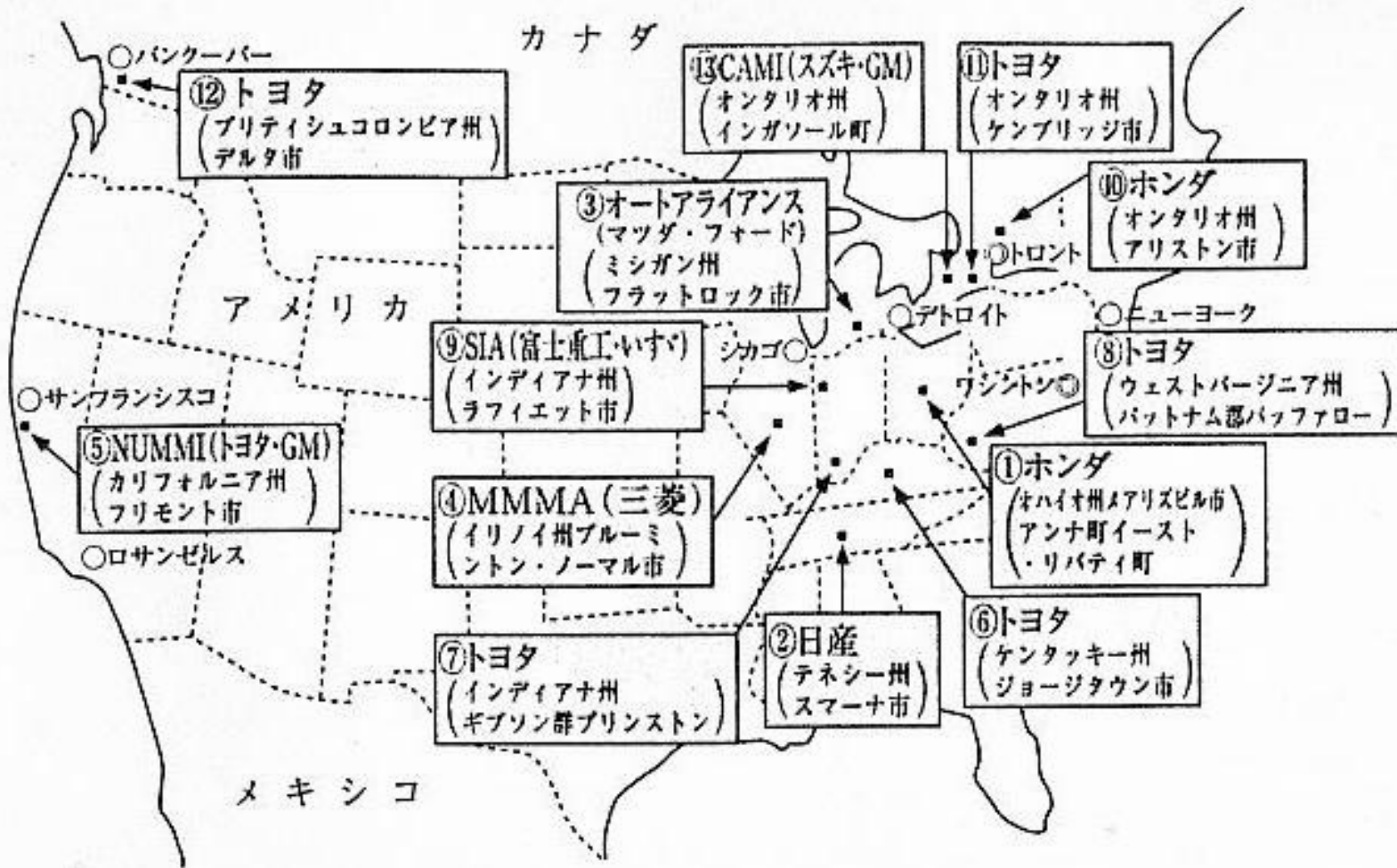
Case: Local North American Factory of Japanese  
Automobile Maker

# Location Strategy of New Factory





# Production Base of Japanese-Affiliated Auto Maker in North America (1999)

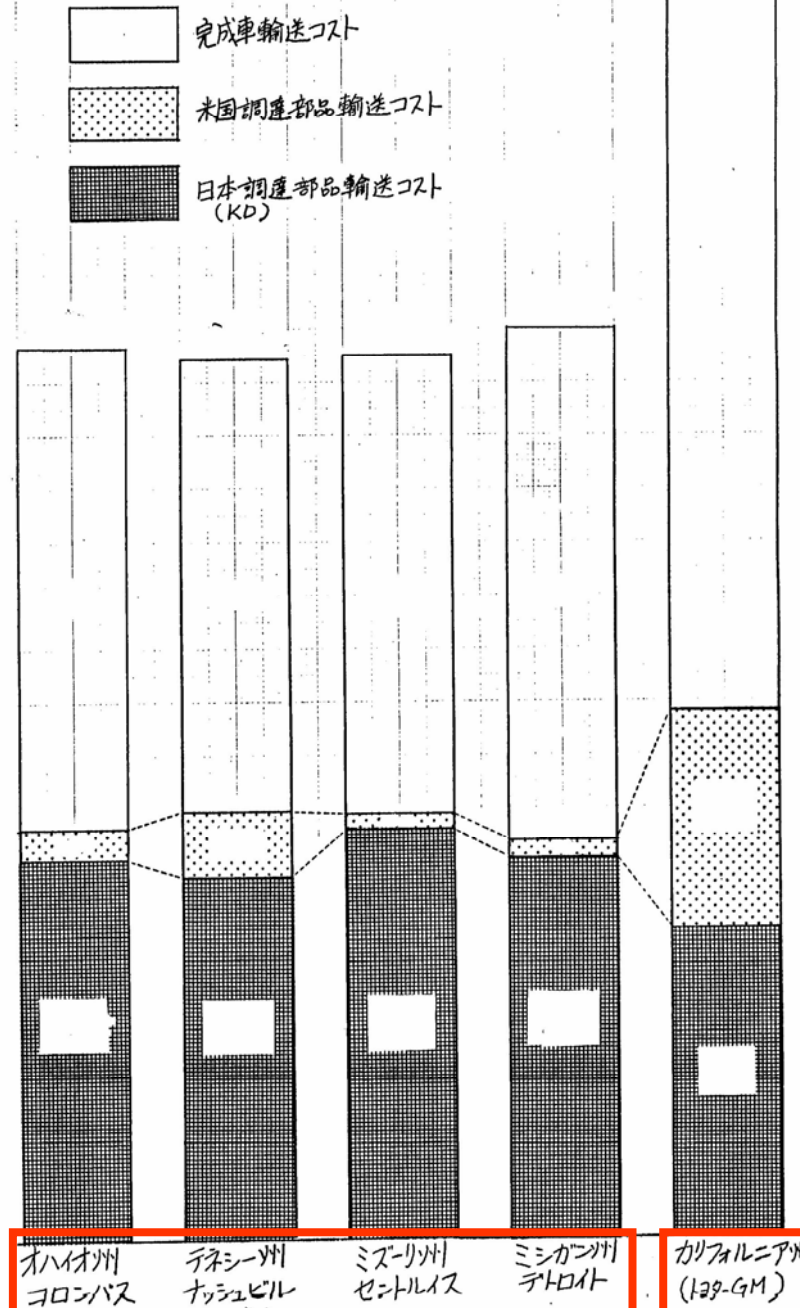


'Automobile engineering of 1999 Japan' Japan Automobile Manufacturers Association, Inc.

Reference: Takahiro Fujimoto 'Introduction to Production Management' Nihon Keizai Shimbun, Inc. 2001 ( I p358)



Candidate Site of Factory and Estimation of Transportation Cost per Car (example)



Midwest: close to center of market and parts industry pool in Detroit

West Cost: cost up due to passing over Rocky Mountains

### (3) Specialization of Factory (focus)

Factory specialized by process (**process focus**)

vs.

Factory specialized by product (**product focus**)

Factory for whole country (national plant)

vs.

Plural factories by local region (regional plants)

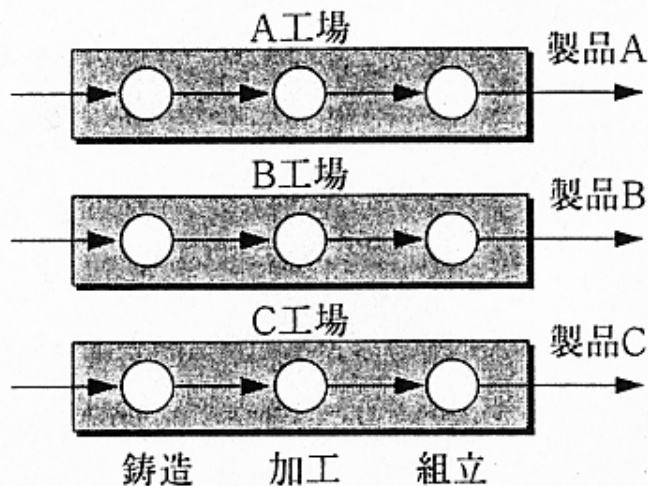
**Development factory** (close to R&D sector, trial and initial productions)

vs.

Volume production factory (satellite factory; local expansion)

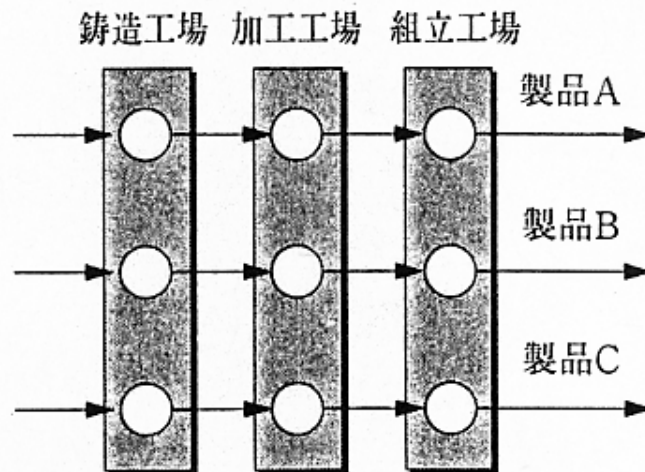
# Focus (Specialized) Strategy of Factory

a. Product focus.  
(specialization according to product)



- 顧客ニーズに迅速に対応
- 新製品導入が比較的容易
- 市場セグメント別専門化が可能
- 原価計算が比較的容易
- ジャスト・イン・タイムを導入しやすい
- 生産工程の重複による非効率
- 製品の工場間での移管が困難
- 製品ごとの好不調によって稼働率にばらつき
- 専門技能養成が軽視される傾向

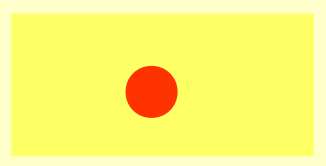
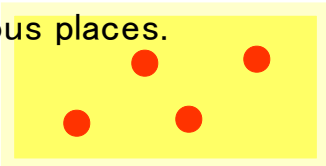
b. Process focus.  
(specialization according to process)



- 生産技術の蓄積が早い
- 工程の重複による非効率が少ない
- 規模の経済。高稼働率を維持しやすい
- 生産技術の標準化を促進
- 製品別の売れ行きにばらつきを吸収
- 市場、技術の変化への対応が遅い
- 生産リードタイムが長い
- 在庫が多い
- 工場間の調整コストが高い

# National Factory and Group of Regional Factories

Locations of plural-factory-network are influenced by the difference in policies on the network building

Network	Strategy	Location	Advantage.	Disadvantage.
<p>①</p> <p>It surpasses it by enhancing the factory until setting up a factory in the heartland, and reaching critical limit. Afterwards, the second factory is built for the first time. (center factory)</p>	<p>The first factory is built in "Center of gravity" of the market. This is enlarged.</p> 	<p><input type="radio"/></p> <p><input checked="" type="radio"/></p> <p><input type="radio"/></p>	<p>Scale economy.</p> <p>It is possible to reel it to a local small factory in the remote place. It is pre-emp as for the rival. (If the other party is a carpenter place. )</p>	
<p>②</p> <p>It sets up a factory one after another in other emphasized regions instead of enhancing the first factory. (making to network)</p>	<p>It thinks about the effect when the factory network is completed, and the factory is distributed to various places.</p> 	<p><input type="radio"/></p> <p><input checked="" type="radio"/></p> <p><input checked="" type="radio"/></p>	<p>Even power is demonstrated in various places.</p> <p>The factory network is complex and time-consuming to coordination. (There is no scale advantage. )</p> <p>Is the first move taken away by the other party?</p>	

## (4) Management of Factory Network

### Flow of money

(local procurement/ transfer-in? reinvestment/transfer-out? borrowing local currency/dollar/Yen)

### Flow of Mono (parts/material/finished product)

(by-product/by-part; for local regions, for Japan, for globe)

### Flow of human

(temporary transfer, dispatch --- from Japan)

### Flow of information/technology/knowledge

(application/adaptation; reverse transfer back to Japan?)

Example: home country's factory and local factory --- age of mutual learning

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due to copyright restrictions

# Does "Trade Off" Exist?

Cost vs. quality

Cost vs. lead-time

Cost vs. flexibility

Among various cost factors (EOQ, etc.)

Among various functional factors (controllability vs. ride quality, etc.)

Position of **static balance** → emphasis on tradeoff

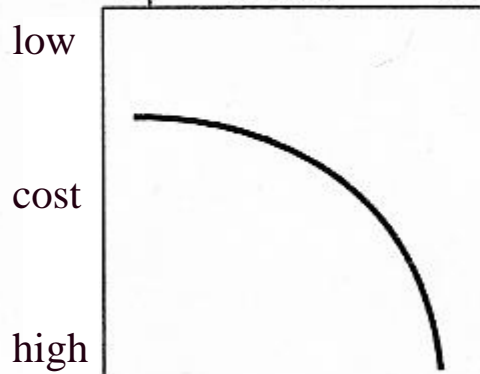
vs.

Position of **dynamic improvement** → without premise of tradeoff

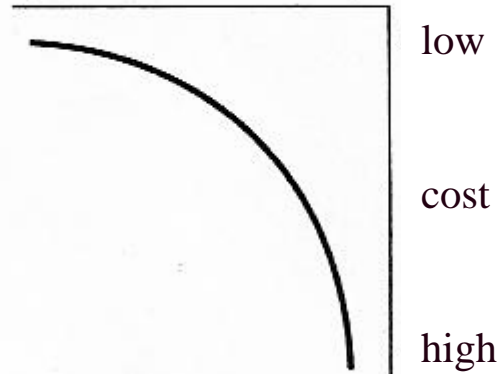


# Trade Off

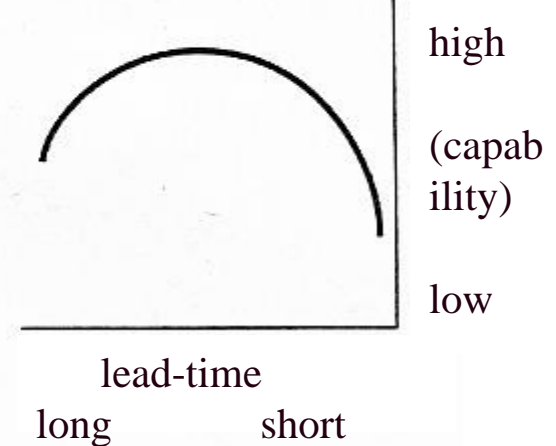
design quality  
low (capability) high



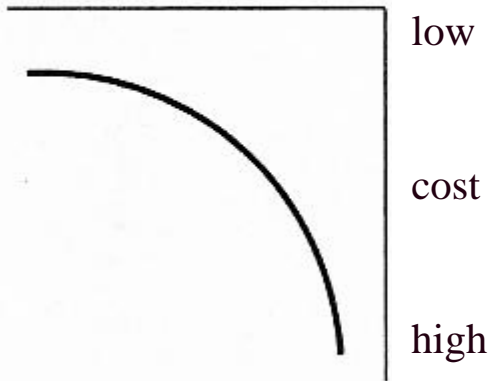
lead-time  
long short



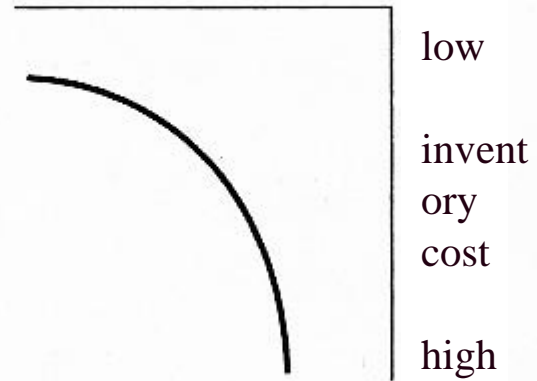
design quality



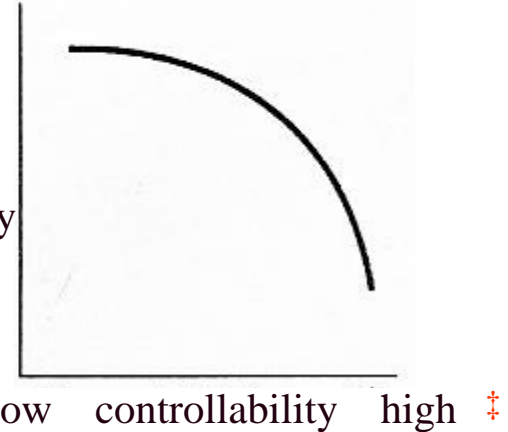
flexibility  
small large



cost of set-up switch  
high low



ride quality





### 3. Thoughts on Production Strategy

Two points of view (One's superiority to another is up to an industry and times.)

#### (1) "Loud" view of production strategy

high-powered, active top management, significant decision making

#### (2) "Steady" view of production strategy

at a glance, non-strategic action in operation level

Meticulous **buildup** in long term → hardly detectable to rival

Was this a strength of Japanese companies ?

(Abernathy)

A balance between these two is important.