

Price-Setting Behavior of Japanese Companies

- The Results of "Survey of Price-Setting Behavior of Japanese Companies" and Its Analysis -

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(Abstract)

1. In recent years, the environment surrounding Japanese companies has been changed by a decrease in the expected growth, globalization, developments in information technology, and deregulation. To investigate how their price-setting behavior has been changing in these conditions, the Bank of Japan conducted the "Survey of Price-Setting Behavior of Japanese Companies" by contacting 1,206 companies listed on the First Section of the Tokyo Stock Exchange. Respondents did not include financial institutions, insurance and general trading companies.
2. Many companies (manufacturing: 69%; nonmanufacturing: 63%) have changed their management strategies to focus on the rate of return on capital because of (i) a decrease in the expected growth in the product market and (ii) a strong pressure from stockholders to increase the rate of return. To increase the rate of return, more than 90% of companies have taken measures of "further increase in productivity or reduction in costs." On the other hand, some companies mainly in manufacturing (manufacturing: 54%; nonmanufacturing: 36%) are adopting non-price measures of "product differentiation instead of cutting prices."
3. At the same time, about 90% of companies respond that "competition has become severe when compared to a few years ago" due to (i) a decrease in total demand, (ii) a scrutiny of business relationships by customers, (iii) an increase in domestic companies and imported products. To cope with severe competition, more than 70% companies resort to "product differentiation." But some companies respond that "price-cut" is inevitable.
4. The price-setting behavior of Japanese companies has gradually changed from the stance that puts weight on capturing "market share" even by cutting prices (which was often pointed out to be a characteristic of Japanese companies), to a stance that focuses on "supply-demand conditions in the market" (thus, price is set at the upper limit permitted by the market), especially in manufacturing. Severe competition makes it difficult for companies to set prices according to the formula of "direct cost plus fixed mark-up," even though they put more importance on the rate of return. Especially, many nonmanufacturing companies strongly feel that "prices tend to be set by customers" under deregulation and developments in information technology.

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5. As the most important factor explaining price rigidity, manufacturing companies respond "co-ordination failure" and nonmanufacturing companies state "implicit contracts." It seems that manufacturing companies aim at increasing the rate of return on capital without cutting price as much as possible (they focus on "rival companies"), while nonmanufacturing companies face difficulties when they try to increase prices (they focus on "customer relationships").
6. In conclusion, many companies' management strategies aim at attaching importance to the rate of return on capital. The price-setting behavior that stresses the importance of capturing market share even by cutting prices has not been preferred in recent years. At the same time, companies have had difficulties setting prices by using the "direct cost plus fixed mark-up" formula because of intensifying competition. As a result, it seems that an increasing number of companies set prices at the upper limit permitted by the market, taking into consideration supply-demand conditions in the market, the behavior of rival companies, customer relationships, and other factors.

1. Introduction

It has been pointed out that Japanese companies have changed their management strategies recently. They once focused on quantitative expansions (sales, market share), but now put priority on the rate of return on capital as growth expectations have been decreasing.¹ They may also have changed their price-setting behavior from cutting product prices to capture market share, to avoiding price-cut to increase the rate of return on capital. These ideas are, however, mere inferences and we do not have sufficient answers to confirm whether corporate pricing behavior has really changed. Meanwhile, there are doubts whether companies that focus on the rate of return can actually avoid price-cut, given severe competition created by globalization, developments in information technology, deregulation, and other factors.

To investigate how this new business environment affects corporate pricing behavior, we carried out the "Survey of Price-Setting Behavior of Japanese Companies" with 1,206 companies listed on the First Section of the Tokyo Stock Exchange. We exclude financial institutions, insurance and general trading companies^{2,3}.

Section 2 outlines the "Survey of Price-Setting Behavior of Japanese Companies" and checks the validity of our sample. Section 3 reports the survey results regarding recent management strategies, competition in the product market and measures taken by companies. Section 4 verifies the way in which companies determine product prices and whether it has been changing. Section 5 discusses the survey results regarding the factors that explain price rigidity. Section 6 reports the conclusions of the survey.

2. Outline of the "Survey of Price-Setting Behavior of Japanese Companies" and characteristics of the sample

(1) Outline of the survey

The survey asked companies to identify one representative "product" by turnover and answer various questions on the basis of the specified product. When the product is difficult to identify, the survey asked them to think of their product as a whole, and

¹ For example, the results from "Report of Survey Research Concerning Corporate Behavior (1999)" released by the Economic Planning Agency, show that Japanese corporate financial strategies have changed from emphasizing "the size of sales and return" to "the rate of return on capital."

² The concept of price is ambiguous for financial institutions and insurance companies. It is extremely difficult for general trading companies to identify their main product. Accordingly, they are excluded from our sample.

³ Similar surveys have been already conducted in the US and UK. Refer to Blinder [1991] and Hall *et al.* [1997] respectively for details.

not specify one product.⁴

- Survey period: From 10th April 2000 to 15th May 2000
- Sample: 1,206 companies listed on the First Section of the Tokyo Stock Exchange, excluding financial institutions, insurance and general trading companies
- The number of respondents: 630 companies <Response rate 52.2%>
- Survey method: The questionnaire was delivered and collected by mail.

(2) Characteristics of the sample (company information)

In the case of a newly conducted survey, it is very important to clarify the characteristics of respondents and compare the results with other macro indicators (e.g. *Tankan*). This procedure is especially important for small samples.

- *Sample*
The survey includes companies listed on the First Section of the Tokyo Stock Exchange. It does not necessarily reflect the price-setting behavior of small companies.
- *Industrial composition* (Chart 1)
The sample is dominated by manufacturing companies (manufacturing: 65%; nonmanufacturing: 35%), which does not reflect the industrial composition of the GDP base (manufacturing: less than 30%).⁵
- *Market share* (Chart 2)
While most manufacturing companies, such as precision machinery, ceramics, stone & clay and transportation machinery, have a high market share, there are many nonmanufacturing companies with a low market share.⁶
- *Product differentiation*⁷ (Chart 3)
Industries such as services, electrical machinery, and transportation machinery where brand image of products are regarded as important, show that their main

⁴ If you are interested in the questionnaire that was sent to companies and total survey results (available in Japanese only), please contact the Research and Statistics Department, the Bank of Japan or refer to "Research Papers" on the Bank of Japan's homepage (<http://www.boj.or.jp>).

⁵ This was also confirmed in the UK study.

⁶ In order to measure market share quantitatively, "indicators measuring market share" were calculated by industry, on the basis of the main product. More specifically, a weighted average of ordered responses (in this case, a large number of responses indicate a high market share for the main product) was computed to obtain a mean score that measures market share. All mean scores in following charts were calculated the same way.

⁷ Product differentiation means that there is a distinct difference between products of each company.

products tend to be differentiated.

- *Growth expectation* (Chart 4)

Many companies seem to expect positive growth of products. Diffusion Index (percentage of companies responding "High growth" and "Moderate growth" minus percentage of companies responding "Negative growth") was +25% in manufacturing and +23% in nonmanufacturing. Construction, ceramics, stone & clay and transportation machinery, however, have pessimistic views about growth. Growth expectations by industry had a strong correlation with the results of the "Survey Research Concerning Corporate Behavior" conducted by the Economic Planning Agency (Chart 4-Appendix).

- *Production capacity and Employment conditions* (Chart 5)

Production capacity and employment conditions are excessive, especially in manufacturing companies (ceramics, stone & clay, textiles, and precision machinery). This result was consistent with the results of the Production capacity DI and the Employment conditions DI in *Tankan* (Chart 5-Appendix).

The information from companies (Market share, Product differentiation, Growth expectation, and Production capacity and Employment conditions), is consistent with other macro indicators and seems to reflect the characteristics of industries to some extent. However, it should be noted that the sample is biased towards large manufacturing companies.

3. Corporate management strategy and environment surrounding the product market

(1) Corporate management strategy - Change from focus on market share to the rate of return -

Looking at recent corporate management strategies (Chart 6-1), while only less than 20% of respondents tend to focus on "market share" (which is often said to be a characteristic of Japanese companies), 60-70% of companies become to weight on "the rate of return."⁸ This change in management strategy is greater in manufacturing than in nonmanufacturing (manufacturing: 69%; nonmanufacturing: 63%).

A main reason for changing strategies is that it is "difficult to expect growth in the product market, compared with the past", which is identified by about 80% of

⁸ IT-related industries where growth expectations are high (Transportation & Communication, Electrical machinery, Industrial machinery) tend to put importance on "market share" as well as "the rate of return."

manufacturing and nonmanufacturing companies (Chart 6-2-1). Around 30% of manufacturing companies stated "a strong pressure to increase the rate of return from banks and stockholders," which came second. On the other hand, both "difficult to make quantitative expansions because of financial difficulties, compared with the past" and "a strong pressure to increase the rate of return from banks or stockholders" was responded by 20% of nonmanufacturing companies.⁹

To increase the rate of return, more than 90% of respondents said they were taking measures of "further increase in productivity and reduction in costs" (Chart 6-2-2). In addition, some companies are engaging in non-price measures of "product differentiation instead of cutting prices." More manufacturing companies take this measure than nonmanufacturing ones (manufacturing: 54%; nonmanufacturing: 36%).

(2) Environment surrounding the product market -intensified competition-

About 90% of companies respond that "competition in the product market has become severe" when compared to 1996-97 (Chart 7-1).

As reasons for that severe competition (Chart 7-2), many companies responded "a decrease in total demand" or "a scrutiny of business relationships by customers." Furthermore, "an increase in foreign companies or imported products" in manufacturing and "an increase in domestic companies" or "deregulation" in nonmanufacturing are also widespread responses, respectively.¹⁰

To cope with severe competition of products (Chart 7-3), more than 70% of companies say they will use the "product differentiation" to deal with severe competition and the percentage is somewhat larger in manufacturing (manufacturing: 76%; nonmanufacturing: 71%). This is consistent with survey results regarding the change in management strategy that focuses on the rate of return (Chart 6-2-2). At the same time, some companies believe that "price-cut" is inevitable (manufacturing: 62%; nonmanufacturing: 64%).

⁹ Nonmanufacturing has relied heavily on financial institutions since the 1980s (Chart 6-Appendix). Since nonmanufacturing tends to be strongly affected by the mechanism "sorting of loan customer by financial institutions → fund restriction → tight finance," anxiety about the financial system from the autumn of 1997 to the end of 1998 makes responses different.

¹⁰ If we look at each industry in more detail, when asked for the main reason for severe competition, textiles and nonferrous metals answer "an increase in foreign companies or imported products", retailers respond "an increase in domestic companies" and electric & gas utility "deregulation."

- (3) The relationship between "management strategy focusing on the rate of return" and "severe competition"

Survey results reveal the following two points:

(i) As companies have gradually changed their management strategies to put priority on the rate of return on capital, some companies basically take measures of "reduction in costs" and other companies do not cut prices by "product differentiation" as much as they did before.

(ii) Although companies do try "product differentiation", they are forced to cut prices given severe competition in the market.

It is possible that the former (i) is the "target" of business management and the latter (ii) is the "reality" companies face. We need to better study these relationships.

Accordingly, we investigate the measures taken by companies which responded both "management strategy that focuses on the rate of return" and "severe competition." Three facts are verified (Chart 8):¹¹

(i) Many respondents that take measures of "further increase in productivity and reduction in costs" to increase the rate of return on capital, also answer "price-cut" as well as "product differentiation" to deal with severe competition. Especially, "price-cut" prevails in nonmanufacturing companies, when compared with manufacturing.

(ii) Many respondents that take measures of "they do not cut prices as much as they did before" to increase the rate of return, respond "product differentiation" to deal with severe competition. This is particularly true for manufacturing companies.

(iii) Around 30% of manufacturing and 20% of nonmanufacturing answered both "they do not cut prices as much as they did before" as measures for focusing on the rate of return and "price-cut" as measures for severe competition.¹²

This shows that companies try various measures to "focusing on the rate of return" and deal with "severe competition." Thus, roughly speaking, there are two types of

¹¹ Percentage of companies that answered both was 63% in manufacturing (255 among 404 companies) and 58% in nonmanufacturing (131 among 226 companies), which is a bit biased towards manufacturing. However, the number of companies that responded to "measures taken for each choice" was 226 in manufacturing and 118 in nonmanufacturing.

¹² Companies that increases the rate of return by "product differentiation without increasing or decreasing prices, compared with the past", gave multiple answers as measures for severe competition. Only one manufacturing and nonmanufacturing company responded "price-cut" alone as measures for severe competition.

companies: (a) companies engaging in non-price measures by product differentiation (b) companies trying to increase the rate of return by further rise in productivity and reduction in costs. Manufacturing tends to be the former (a), and nonmanufacturing the latter (b). In addition, while companies have a "target" that increases the rate of return without cutting prices, some companies take "price-cut" as a result of market pressure when the environment surrounding companies becomes severe.

4. Corporate price-setting stance

(1) Current price-setting stance

The survey asked companies to assess the relative importance of the following factors that are thought to influence price formation.

- (i) *Direct cost plus fixed mark-up*
Price is made of direct costs (personnel expenses, raw material costs, etc.) per unit plus a fixed percentage mark-up which is set at a level designed to achieve a desired gross profit per unit.
- (ii) *Market condition*
Price is set at the upper limit permitted by the market (weak relationship with costs, such as personnel expenses or material costs and strong relationship with supply-demand conditions in the market).
- (iii) *Market share*
Price is determined by importance of market share (quantitative expansions) and competitor prices (foreign companies or imported products) rather than mark-up.
- (iv) *Customer set*
Price tends to be set by customers.
- (v) *Regulatory agency or law*
Price is determined by a regulatory agency or law.

Survey results show that "market share" (thought to be one of characteristics of Japanese corporate behavior), came second in manufacturing, third in nonmanufacturing (Chart 9-1). Top preference for both industries was, if anything,

"market condition."¹³ "Direct cost plus fixed mark-up" was third in manufacturing, fourth in nonmanufacturing.

Looking at results by industry (Chart 10), rankings were similar among manufacturing industries. In nonmanufacturing, construction and retailing were most conscious of "customer set" and transportation & communication and electric & gas utilities ranked "regulatory agency or law" first.

(2) Change in price-setting stance (comparison with 1996-97)

Next, the survey asked companies whether the factors that influence price-setting has changed, compared with 1996-97 (Chart 11-1). Given severe competition in the product market, pricing based on "direct cost plus fixed mark-up" placed fourth in both manufacturing and nonmanufacturing. They put more importance on pricing that was based on "market condition."

Under such circumstances, not only construction and wholesaling but also many other nonmanufacturing industries responded that "customer set" has become an important factor in price determination, compared with 1996-97 (Chart 11-2). This may support the conclusions in section 3 that nonmanufacturing companies tend to adopt "price-cut" as measures for severe competition. In this respect, developments in information technology and deregulation might influence price-setting behavior mainly in nonmanufacturing industries. Moreover, it turned out that pricing in response to customers, specific time, and days strongly affects a nonmanufacturer's pricing stance (Chart 12).¹⁴ That is to say, mounting consciousness of "customer set" leads companies to make efforts to meet diversified customer's needs.

These results imply that Japanese price-setting behavior has changed as follows:

(i) Pricing that focuses on capturing market share even by cutting prices (which was often pointed out to be a characteristic of Japanese companies), has become less important.

(ii) Although corporate management strategies becomes to focus on the rate of return, pricing according to "direct cost plus fixed mark-up" is not necessarily widespread. They tend to adopt a pricing stance that maximizes profits, considering supply-demand conditions. This is more so for manufacturing.

¹³ Similar results were confirmed in the UK study (see Chart 9-2).

¹⁴ In nonmanufacturing industries, such as retailing, transportation & communication, electric & gas utilities, and services, their DIs (percentage of companies responding "very important" and "moderately important" minus percentage of companies responding "less important") are equal to or more than the average of nonmanufacturing.

(iii) Nonmanufacturing is more inclined than manufacturing to set prices by "customer set" partly due to developments in information technology and deregulation, which has intensified price competition.

5. Factors explaining price rigidity

(1) Evidence that prices are sticky

In order to verify price stickiness¹⁵, the survey first asked, "How many times has the price of your main product changed during the year?" (Chart 13-1) The result shows that there is a strong mode at "1 to 2 a year" in both manufacturing and nonmanufacturing (except for "N/A"). Indeed, "1 to 2 a year" seems to be less frequent, provided that companies take elastic price setting stance in response to raw material costs that change as a result of market conditions. In reality, information costs and business relationships with customers have created a situation in which most companies change prices by settlement term, thus, "1 to 2 times a year."¹⁶ The same result was confirmed in the UK study (Chart 13-2).

(2) Factors explaining price rigidity

The survey asked companies to rank the importance of each factor to explain price rigidity. Factors that influence price stickiness are outlined with brief explanations for each as follows:¹⁷

(i) *Explicit contracts*

If costs increase, prices for existing customers cannot increase except after contract renegotiation.

(ii) *Implicit contracts*

Although there are no explicit contracts with customers, companies refrain from increasing prices to maintain a "good relationship" with customers.

(iii) *Procyclical elasticity*

¹⁵ Theoretically, if price adjustments are very flexible, changes in the level of nominal money have no effect on the real economy, which is the so-called "money neutrality." If this is true, monetary policy does not affect the real economy. Therefore, it is important to examine price stickiness to explain the validity of monetary policy.

¹⁶ Specifically, while most manufacturing companies change prices at "1 to 2 times a year", nonmanufacturing, especially wholesaling, retailing and services also reprice "weekly" or "monthly" in addition to "1 to 2 times a year." Price stickiness can be seen in more manufacturing than nonmanufacturing.

¹⁷ To compare with the US and UK studies, (vii) and (viii) are combined.

When business turns down, companies lose their least loyal customers first, retaining their most loyal ones. Since the remaining customers are not very sensitive to price, the company does not reduce its price as it might otherwise do.

(iv) *Co-ordination failure*

If costs have risen (fallen), companies may want to raise (lower) the price of main products. However, companies wait until another company(s) including foreign one(s) has raised (lowered) the price of their product before changing prices.

(v) *Pricing thresholds*

Companies practice "Threshold" pricing - i.e., deliberately pricing products to be below key pricing points. For example, charging 2,980 yen, rather than 3,000 yen.

(vi) *Menu costs*

Company considers not changing the price of main product because the costs of actually changing prices is prohibitive e.g., reprinting catalogues, physically changing the price of goods in a store.

(vii) *Delivery lags/service*

If demand for a main product increased before prices are raised, companies first consider lengthening delivery time or providing less auxiliary service.

(viii) *Non-price elements*

Since customers regard non-price elements (quality of product, auxiliary service) as vital and a price-cut does not necessarily result in the expansion of market share, companies do not reduce the price of their main product.

(ix) *Price means quality*

If a company were to cut the price of its good, customers would assume that quality had been reduced.

Survey results (Chart 14-1)¹⁸ indicate that on the basis of all industries, "co-ordination failure" turn out to be the most important and "implicit and explicit contracts" came second and third among the nine factors. By industry, manufacturing

¹⁸ As introduced in footnote 6, "mean score" was employed in Chart 14 because (i) there are five ordered responses and (ii) to compare with US and UK studies. Low mean scores indicate that the factor is very important and that DI has a large positive value.

companies regard "co-ordination failure" as most important and nonmanufacturing companies (in which each mean score is not so high as a whole), put "implicit contracts" first. Meanwhile, "menu costs", which is often taken up in economics textbooks, is recognized as less important (ranked seventh in manufacturing, and eighth in nonmanufacturing).¹⁹

The US and UK studies also showed that "co-ordination failure" and "explicit and implicit contracts" were regarded as important relative to other factors (Chart 14-2-1).²⁰ Furthermore, while whole industries in UK focused on "explicit and implicit contracts" with the exception of retailing, which put first priority on "pricing thresholds", the rankings by Japanese nonmanufacturing companies were similar to those in the U.K., but manufacturers were most conscious of "co-ordination failure" (Chart 14-2-2).²¹

(3) The change of factors explaining price rigidity (comparison with 1996-97)

The survey subsequently asked how the factor for price rigidity has changed compared with 1996-97 (Chart 15). As a result, "co-ordination failure" in manufacturing and "implicit contracts" in nonmanufacturing became the most important.

These results show that whereas manufacturing companies focus on "rival companies" and strive to increase the rate of return without cutting prices as much as possible. Nonmanufacturing companies tend to price according to "customer set" to maintain a good relationship with customers.

6. Concluding remarks

We have showed the survey results and some analyses on changes in price-setting behavior of Japanese companies. A brief summary highlights as follows:

(i) Many companies appear to be adopting a stance that focuses on the rate of return as a result of a decrease in the expected growth in the product market. At the same time, they recognize changes in the business environment, such as intensified competition in the product market under developments in information technology, deregulation, and

¹⁹ "Menu costs" does not seem to be important in both Blinder [1991] and Hall *et al.* [1997].

²⁰ In the US study, "non-price elements" are considered to be the most important factor. This might be caused by the small sample bias (200 companies).

²¹ In addition to these industrial characteristics, the ordered probit models were estimated to investigate how company information, such as market share and product differentiation, does affect factors explaining the price rigidity. See an

globalization.

(ii) On the whole, corporate price-setting stance has gradually changed from the stance that focuses on capturing market share even by cutting prices, to a stance that puts more importance on the rate of return. It is, however, difficult for companies to set prices according to the formula "direct cost plus fixed percentage mark-up" under this severe competition. Therefore, it seems that pricing that maximizes returns considering market conditions and the behavior of rival companies, has become widespread.

(iii) If we break it down by industry, many manufacturing companies do not cut prices by product differentiation as much as they did before. For nonmanufacturing companies, however, prices tend to be set by customers under developments in information technology and deregulation, resulting in intensifying price competition.

In addition, we need to take the following points into consideration, in relation to our survey results.

(i) A decrease in the expected growth is one of the major reasons why companies have changed their management strategies to focus on the rate of return on capital. Therefore, if growth expectations become high again, corporate pricing stance is likely to return to one emphasizing quantity or market share.

(ii) Under severe competition, companies work hard to increase productivity more than before. If companies attain great increases in productivity as a result of the developments of information technology, companies could maintain a high rate of return even when they cut prices.

Appendix: The Ordered Probit Model

The ordered probit model is a method to estimate the influence of each respondent's characteristic on the replies to a given question item in an ordered response format.²² Specifically, while nine factors (with five ordered responses) that explain price rigidity are employed as dependent variables, companies' characteristics, such as market share, product differentiation, growth expectation, product capacity and employment conditions are used as independent variables.

Specification

$$\text{Rigidity}_i = \alpha * \text{Share} + \beta * \text{Dif} + \gamma * \text{Growth} + \delta * \text{K} + \varepsilon * \text{L}$$

Rigidity_i: (i=1-9)

- 1: "Explicit contracts" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 2: "Implicit contracts" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 3: "Procyclical elasticity" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 4: "Co-ordination failure" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 5: "Pricing thresholds" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 6: "Menu costs" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 7: "Delivery lags/service" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 8: "Non-price elements" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)
- 9: "Price means quality" (1:very important, 2:important, 3:moderately important, 4:less importance, 5:totally unimportant)

Share: Market share (1:less than 10%, 2:10-20%, 3:20-30%, 4:30-40%, 5:40-50%, 6:over 50%)

Dif: Product differentiation (1:very differentiated, 2:differentiated, 3:occasionally differentiated, 4:less differentiated, 5:not differentiated)

Growth: Growth expectation (1:high growth, 2:moderate growth, 3:zero growth, 4:negative growth)

K: Production capacity (1:excessive, 2:excessive to some extent, 3:excessive as a whole, but partly insufficient, 4:adequate, 5:insufficient)

L: Employment conditions (1:excessive, 2:excessive to some extent, 3:excessive as a whole, but partly insufficient, 4:adequate, 5:insufficient)

²² Refer to Nakagawa [1999] for details of the ordered probit model.

Estimation results

	Rigidity1	Rigidity2	Rigidity3	Rigidity4	Rigidity5	Rigidity6	Rigidity7	Rigidity8	Rigidity9
Share	0.01 (0.47)	-0.01 (-0.43)	0.02 (0.76)	-0.04 (-1.48)	-0.00 (-0.02)	-0.01 (-0.49)	0.04 (1.40)	-0.02 (-0.58)	0.03 (0.91)
Dif	0.06 (1.64)	0.03 (0.72)	0.10 (2.55)	-0.03 (-0.70)	0.08 (2.15)	0.15 (3.54)	0.10 (2.28)	0.09 (2.32)	0.18 (4.34)
Growth	-0.09 (-1.45)	-0.04 (-0.62)	0.08 (1.33)	-0.07 (-1.13)	0.08 (1.34)	0.14 (2.22)	0.04 (0.57)	-0.10 (-1.75)	-0.07 (-1.14)
K	0.01 (0.25)	0.07 (1.28)	0.04 (0.71)	-0.01 (-0.10)	0.01 (0.15)	0.11 (2.04)	0.19 (3.46)	-0.02 (-0.33)	0.06 (1.10)
L	0.11 (2.10)	0.08 (1.49)	0.02 (0.38)	0.12 (2.33)	0.09 (1.68)	0.13 (2.36)	-0.01 (-0.14)	-0.03 (-0.60)	-0.05 (-0.87)
Pseudo-R ²	0.006	0.006	0.008	0.008	0.006	0.025	0.018	0.006	0.017
LR stat	0.042	0.109	0.073	0.029	0.075	0.000	0.001	0.122	0.001

Notes: 1. Figures in parentheses show the z-value (the asymptotic t-value).

2. Dark and light shadowed areas have a significance of 1 and 5 percent, respectively.

The estimation results above show no statistically significant relationship between variables as a whole, but imply the following two points:

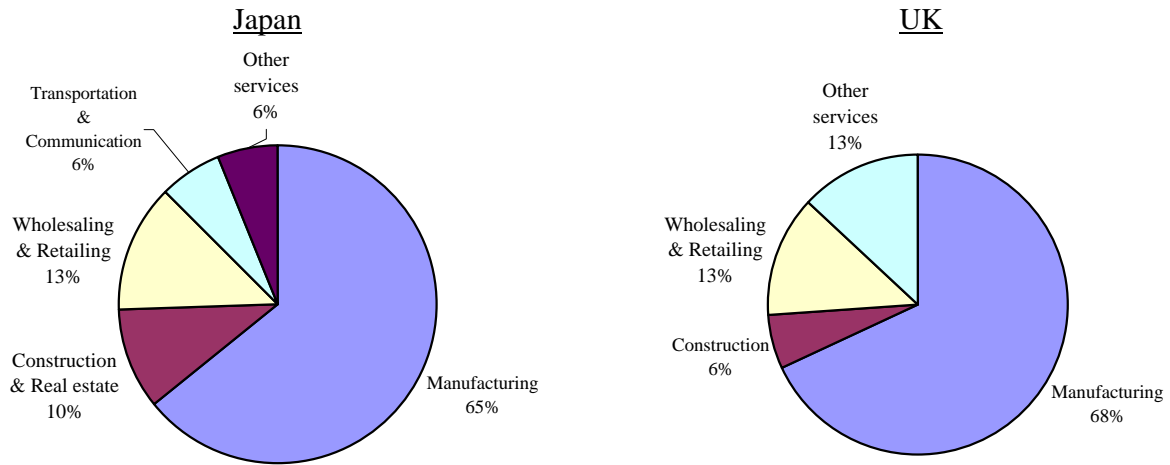
(i) There is a high possibility that companies whose products are very differentiated regard many factors explaining price rigidity, particularly "menu cost" and "price means quality" as very important. It is natural that they put more importance on non-price elements (thus, they are reluctant to change prices).

(ii) Companies whose production capacity is insufficient have a high possibility of responding that "delivery lags/service" are totally unimportant, which is related to their insufficient production capacity and inventory.

[References]

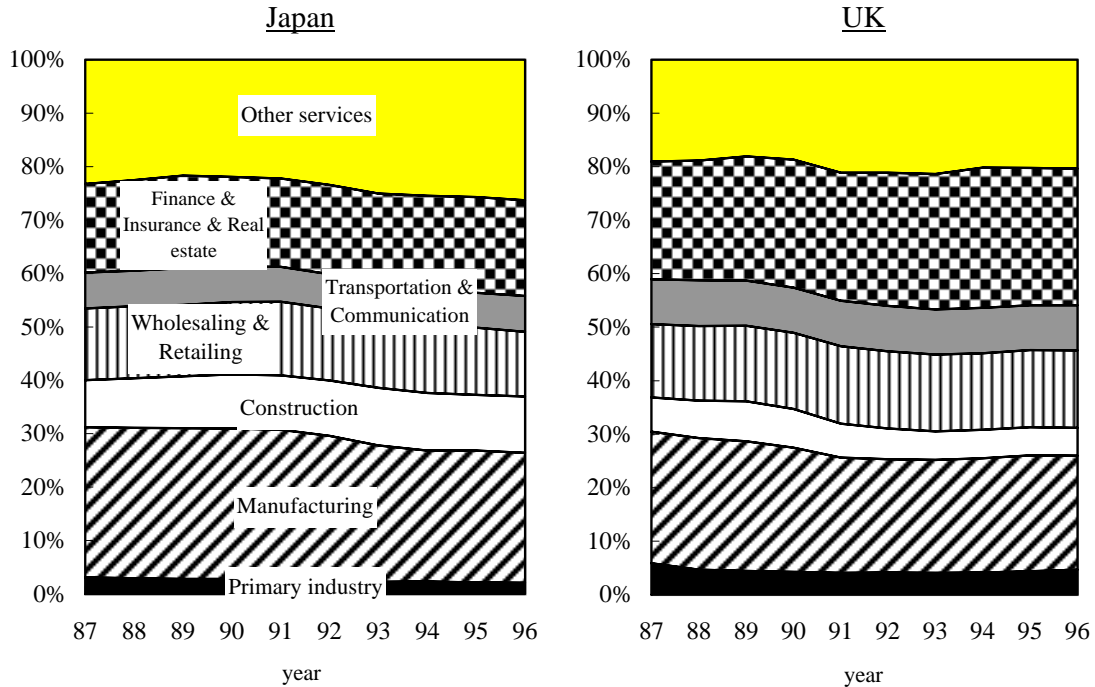
- Blinder, Alan S., "Why are Prices Sticky? Preliminary Results from an Interview Study," *American Economic Review*, May 1991.
- Hall, Simon, Mark Walsh, and Anthony Yates, "How do UK companies Set Prices?," Bank of England, *Working Paper Series No.67*, July 1997.
- Hayakawa, Hideo and Maeda, Eiji, "Understanding Japan's Financial and Economic Development Since Autumn 1997," Research and Statistics Department, Bank of Japan, *Working Paper Series 00-1*, January 2000.
- Kasuya, Munehisa, "Downward Price Rigidity of Japanese CPI — Analysis by Probability Density Functions and Spatial Density Functions," Research and Statistics Department, Bank of Japan, *Working Paper Series 99-3*, August 1999.
- Nakagawa Shinobu, "Why Has Japan's Household Savings Rate Remained High even during the 1990s?," *Bank of Japan Monthly Bulletin*, April 1999.

Industrial Composition



Notes: 1. Percentage of survey respondents in each category.
 2. UK quoted from Hall *et al.* [1997].

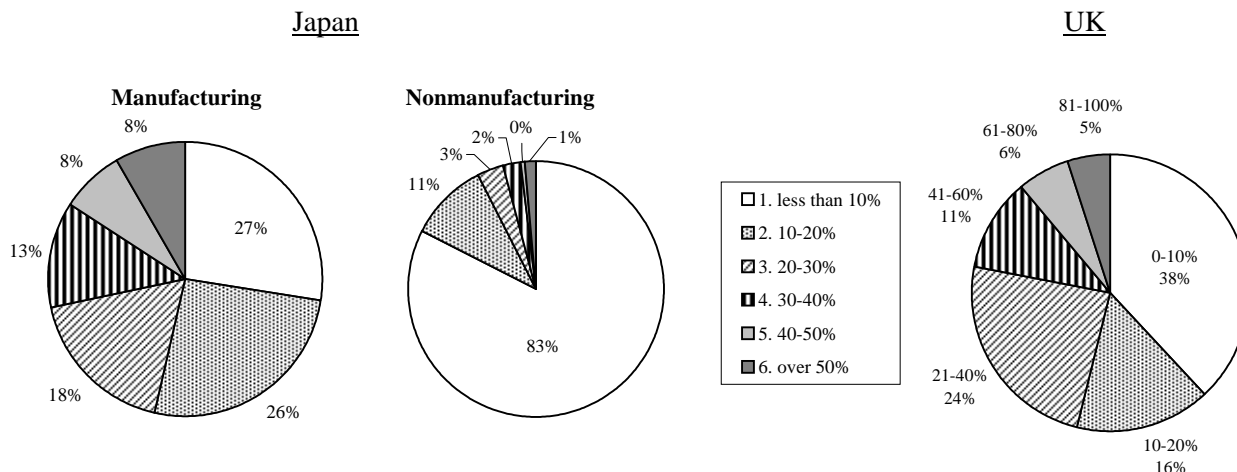
Reference: Transition of Industrial Composition <Based on GDP>



Source: Bank of Japan, "Comparative Economic and Financial Statistics."

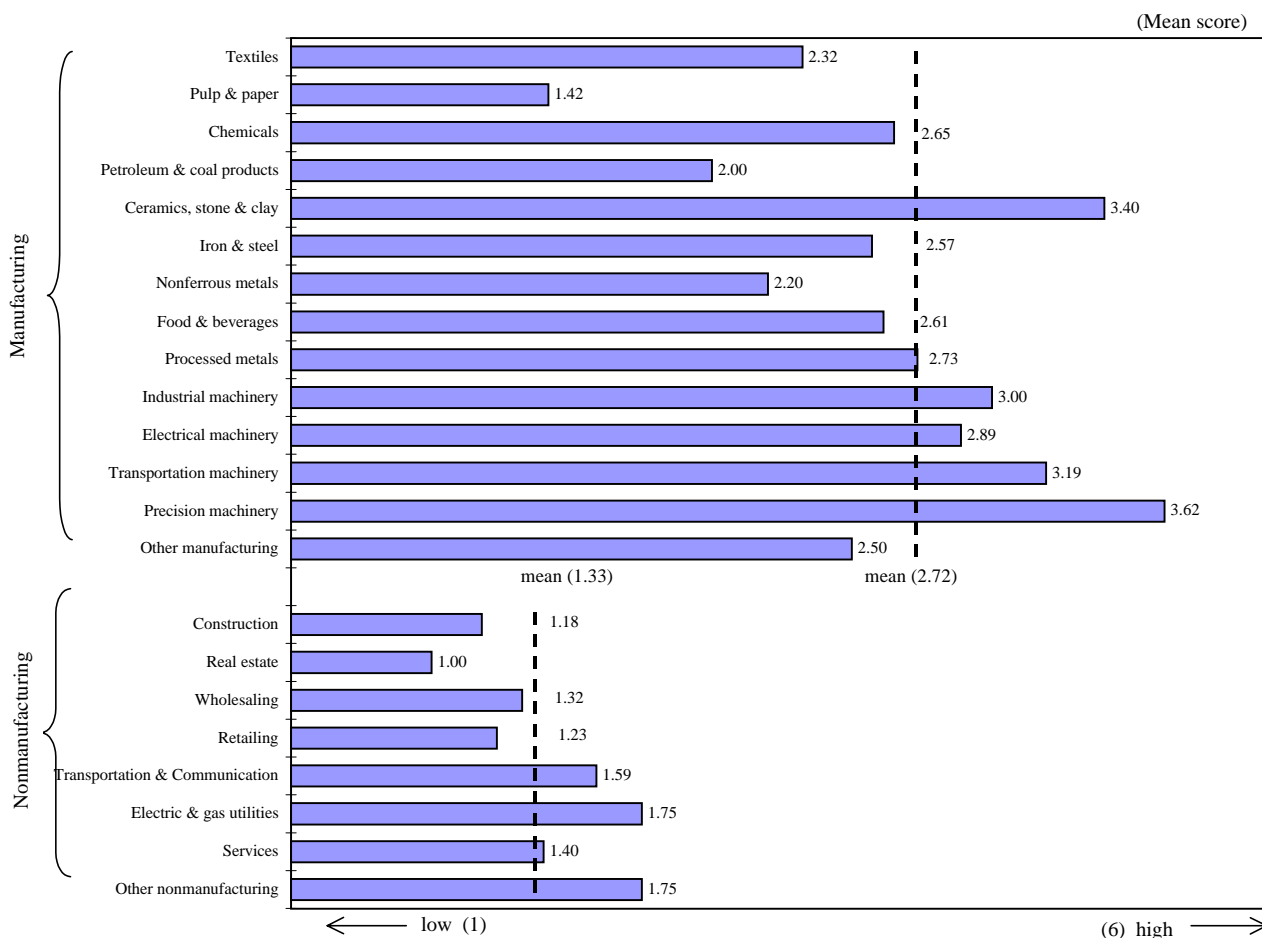
Market Share of Products by Industry

(1) Market Share



Note: UK taken from Hall *et al.* [1997].

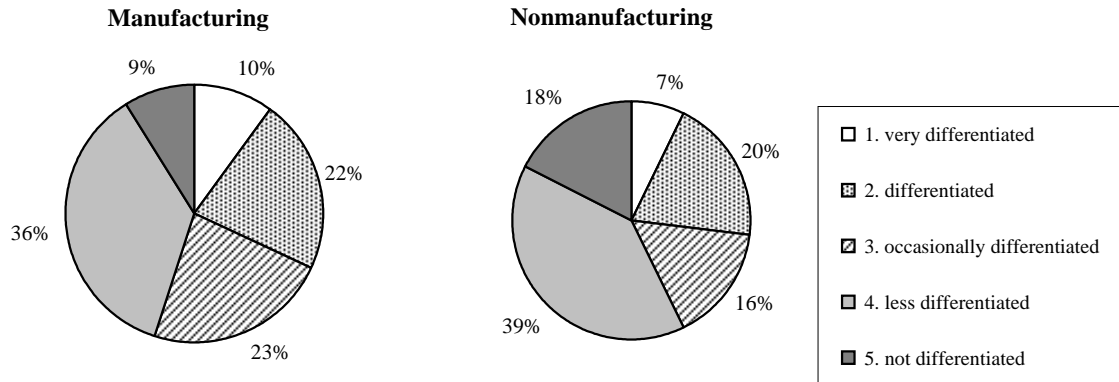
(2) Indicators Measuring Market Share



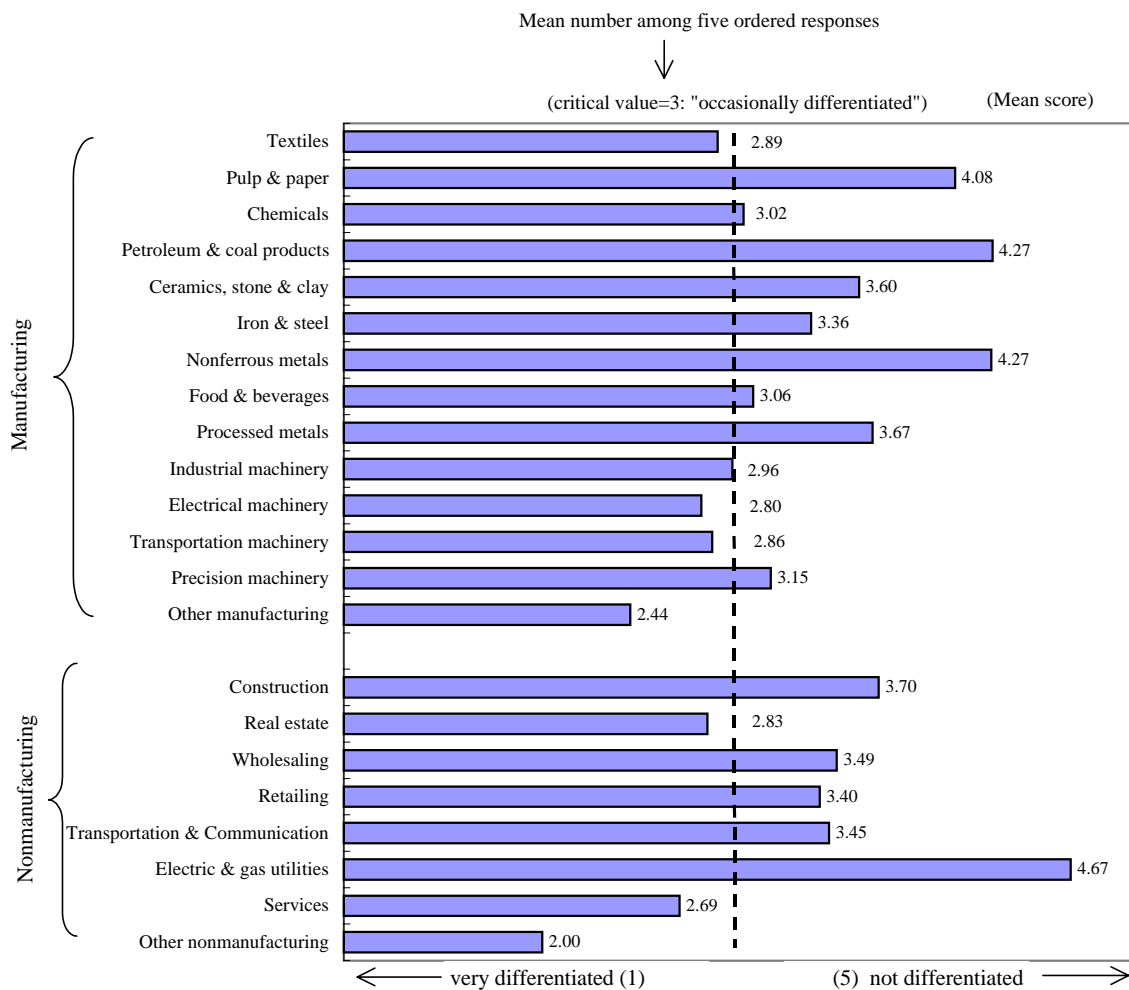
Note: High scores indicate that market share of the main product is high.

Product Differentiation by Industry

(1) Product Differentiation



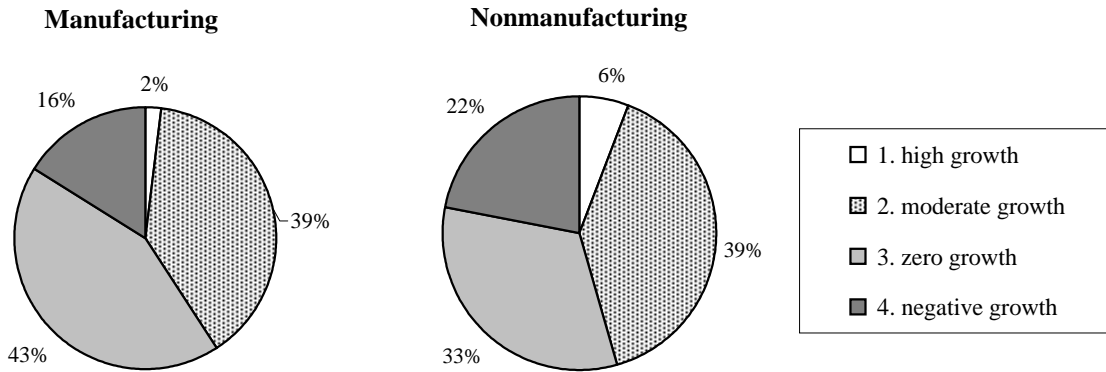
(2) Indicators Measuring Product Differentiation



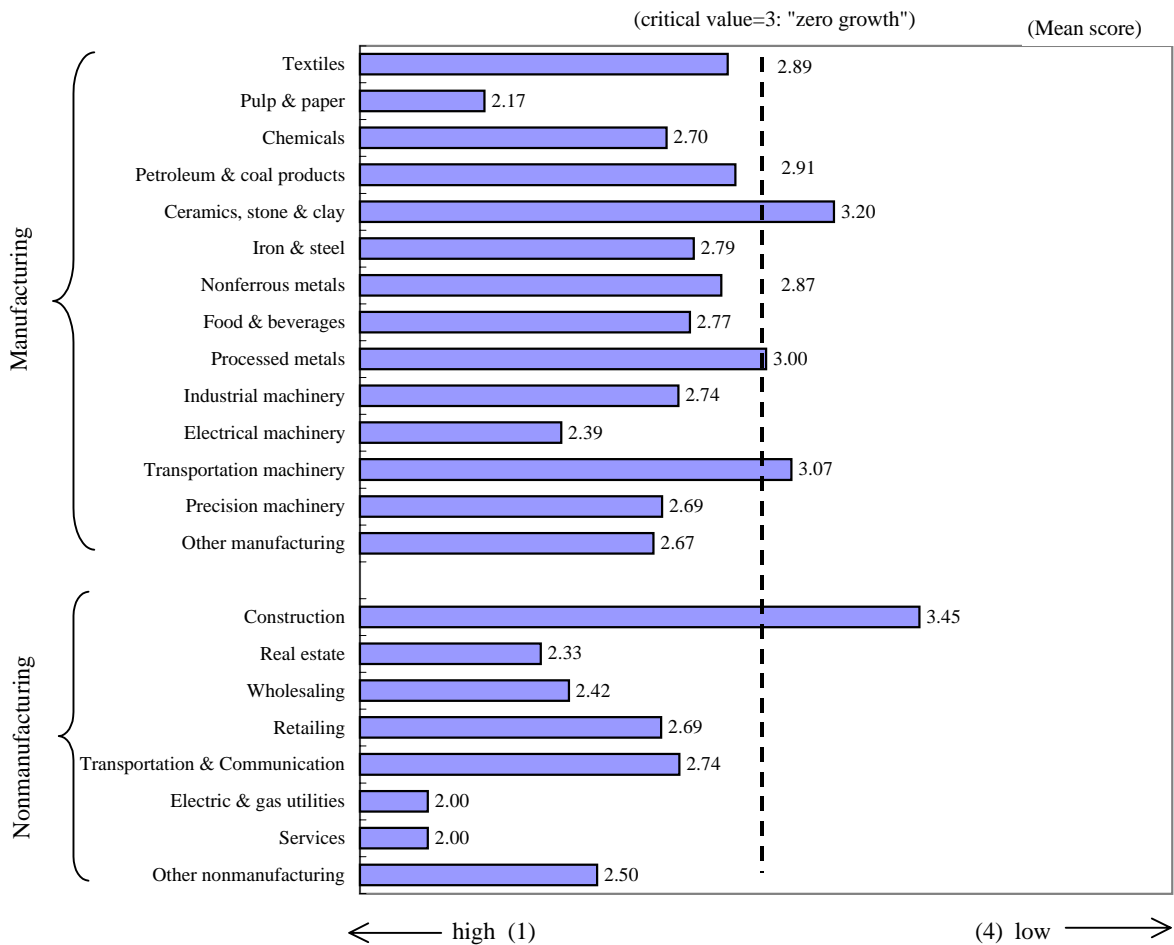
Note: Low scores indicate that the main product is very differentiated.

Growth Expectation of the Product Market by Industry

(1) Growth Expectation of the Product Market



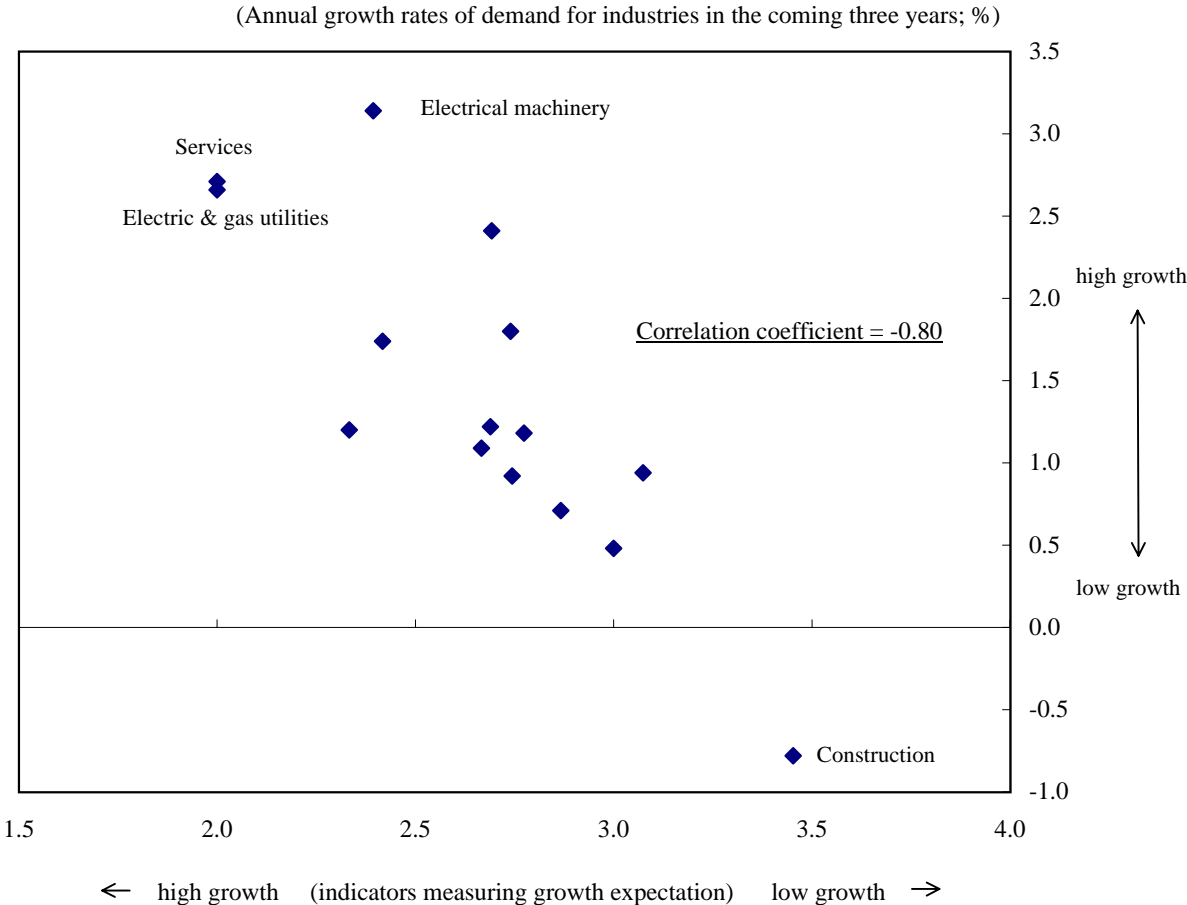
(2) Indicators Measuring Growth Expectation



Note: Low scores indicate that growth expectations for the product market are high.

Growth Expectation

The chart below shows the relationship between indicators measuring growth expectation (chart 4) and the results of "Report of Survey Research Concerning Corporate Behavior" conducted by the Economic Planning Agency.

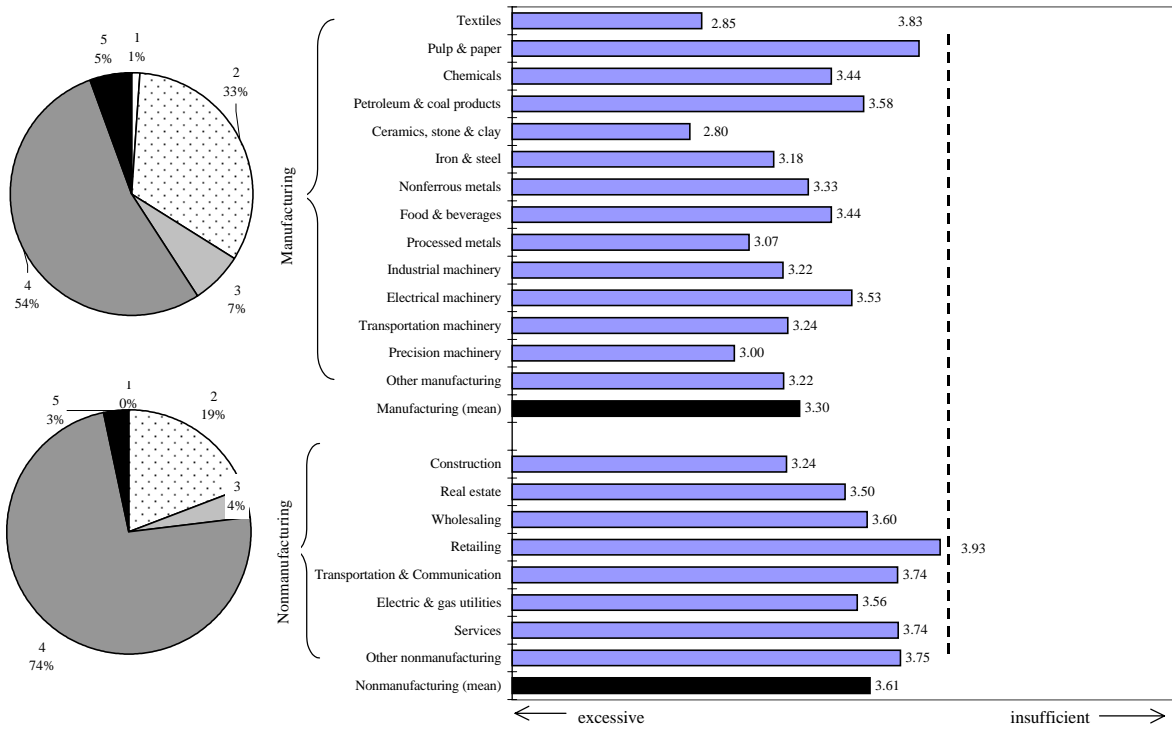


Note: Refer to chart 4 for indicators measuring growth expectation.

Source: Economic Planning Agency, "Report of Survey Research Concerning Corporate Behavior (1999)."

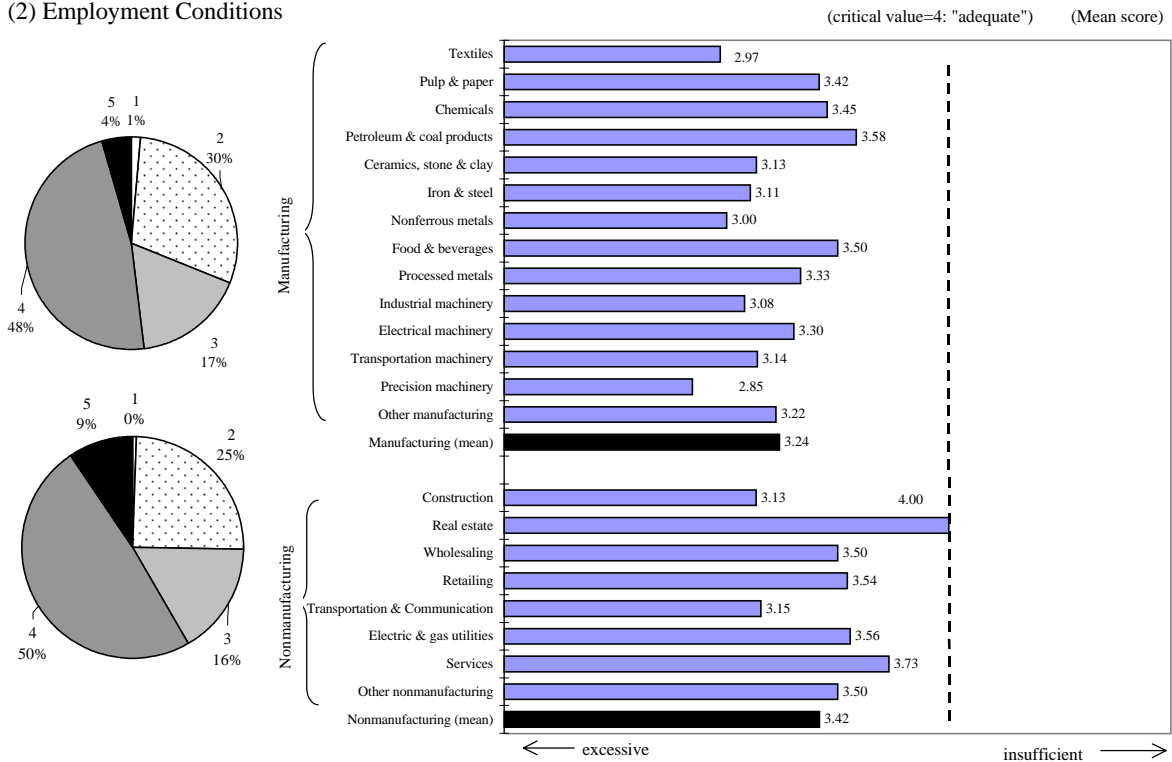
Production Capacity and Employment Conditions by Industry

(1) Production Capacity



Note: High scores indicate that production capacity is insufficient.
 [Choices] 1: excessive, 2: excessive to some extent, 3: excessive as a whole, but partly insufficient, 4: adequate, 5: insufficient

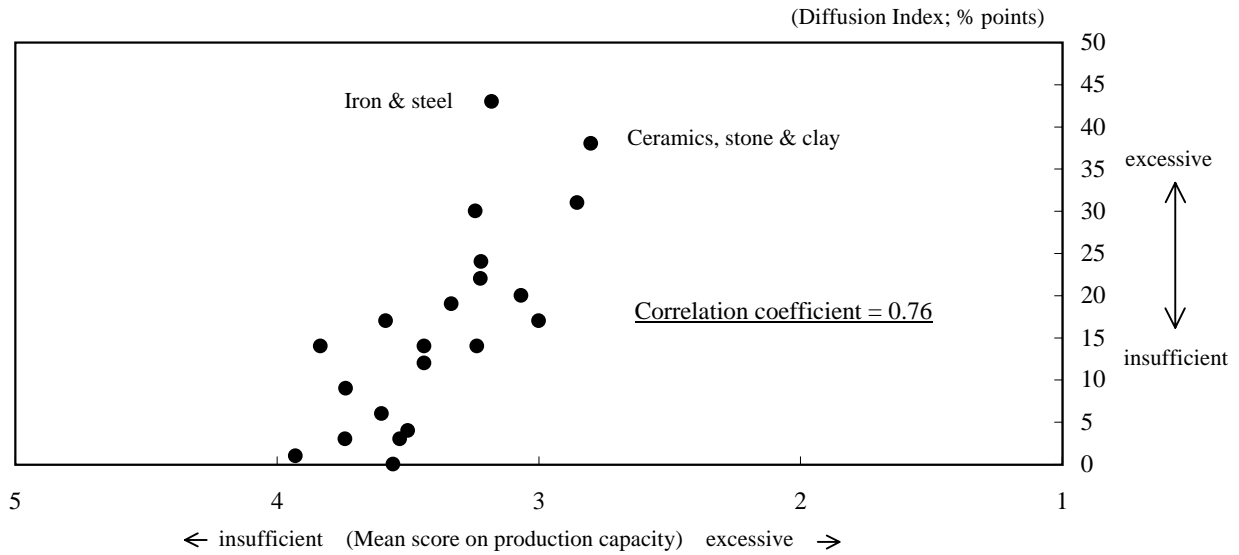
(2) Employment Conditions



Note: High scores indicate that employment conditions are insufficient.
 [Choices] 1: excessive, 2: excessive to some extent, 3: excessive as a whole, but partly insufficient, 4: adequate, 5: insufficient

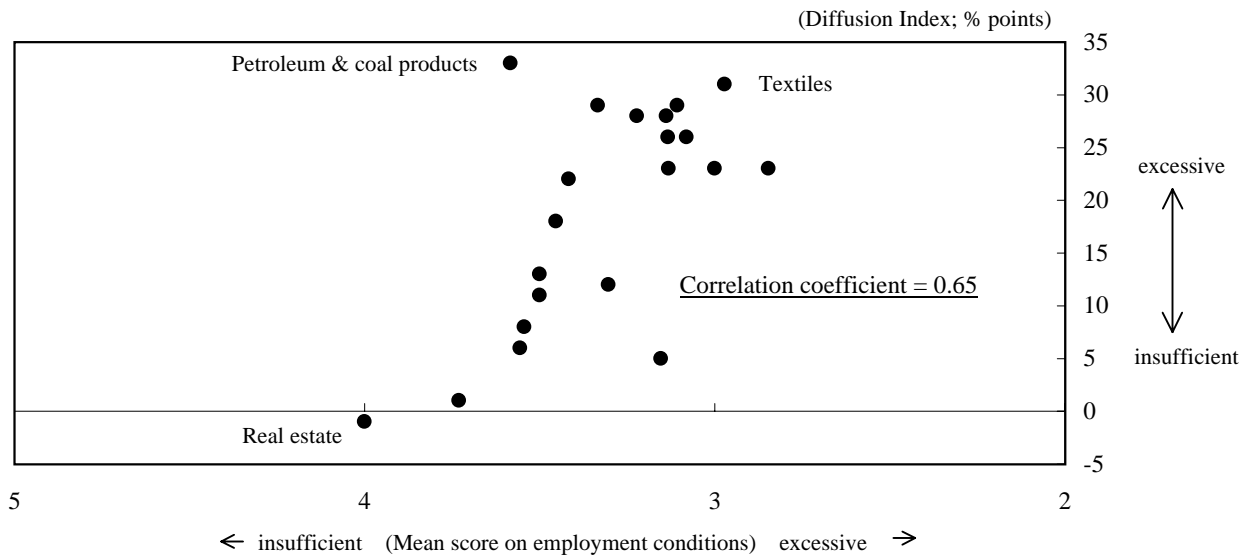
Production Capacity and Employment Conditions

(1) Survey Results Regarding Production Capacity and Production Capacity DI



Note: Production capacity DI is taken from "Short-term Economic Survey of All Enterprises in Japan (2000/1Q)."

(2) Survey Results Regarding Employment Conditions and Employment Conditions DI

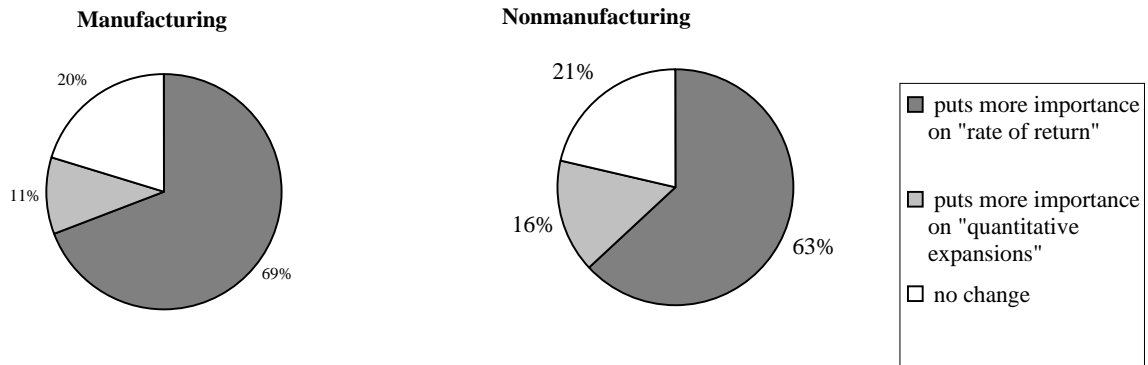


Note: Employment conditions DI is taken from "Short-term Economic Survey of All Enterprises in Japan (2000/1Q)."

Source: Bank of Japan, "Tankan Short-term Economic Survey of Enterprises in Japan."

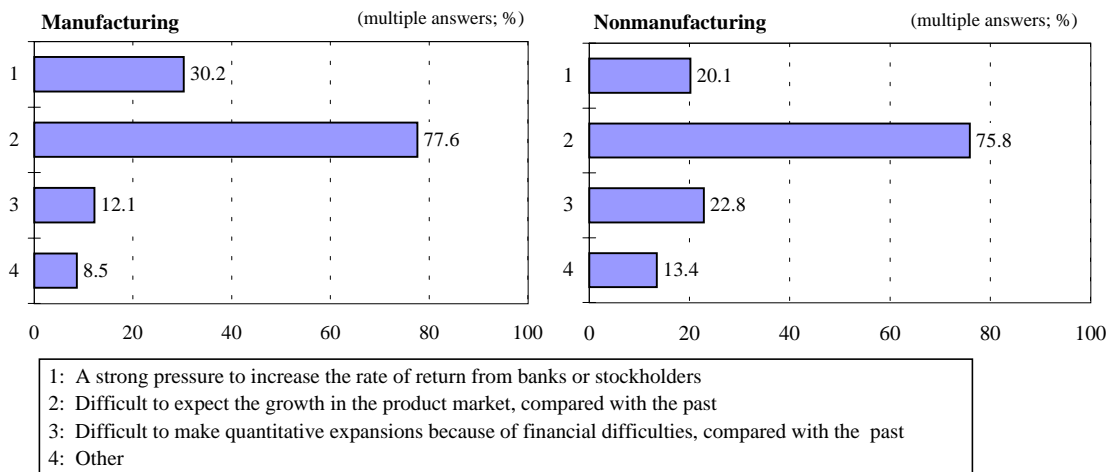
Japanese Corporate Management Strategy

(1) Change in Management Strategy (Comparison with 1996-97)

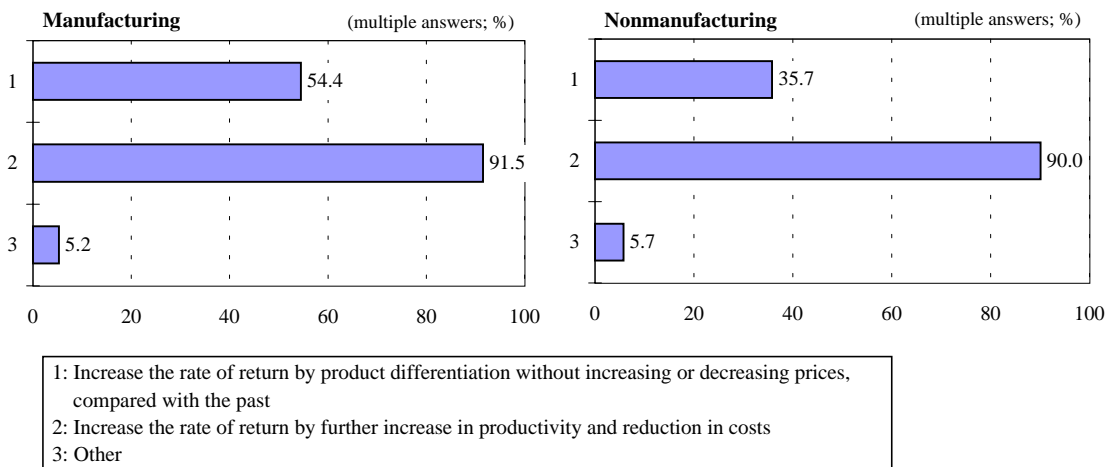


(2) Management Strategy Attaching Importance to "Rate of Return"

(i) Reasons for Change



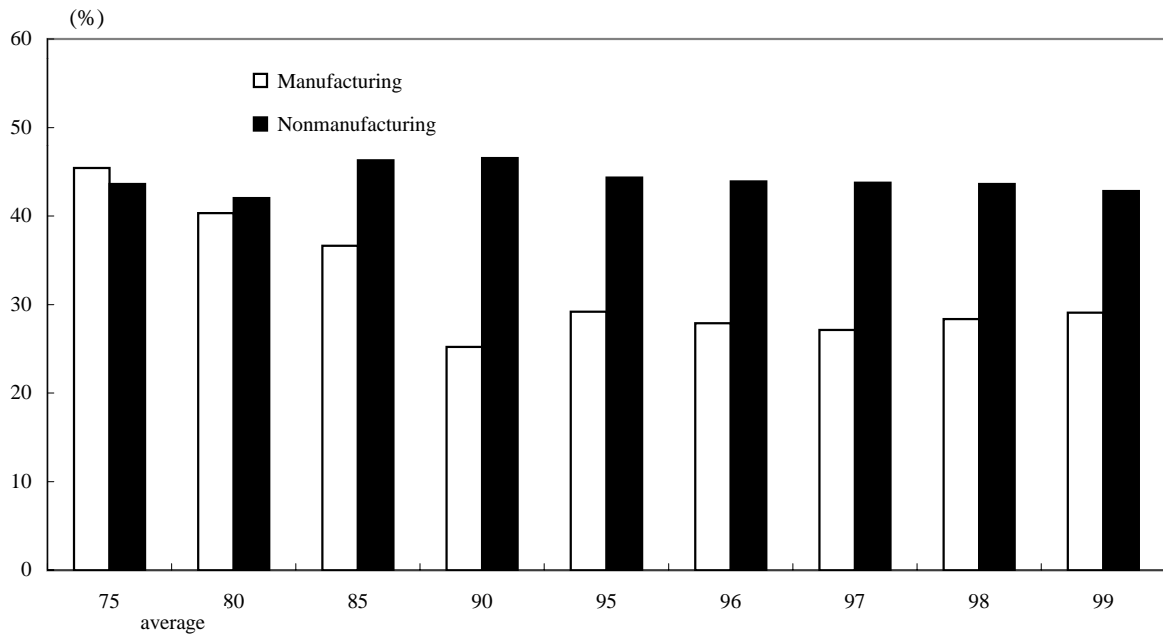
(ii) Measures to Achieve a Goal



Note: The question allows multiple answers.

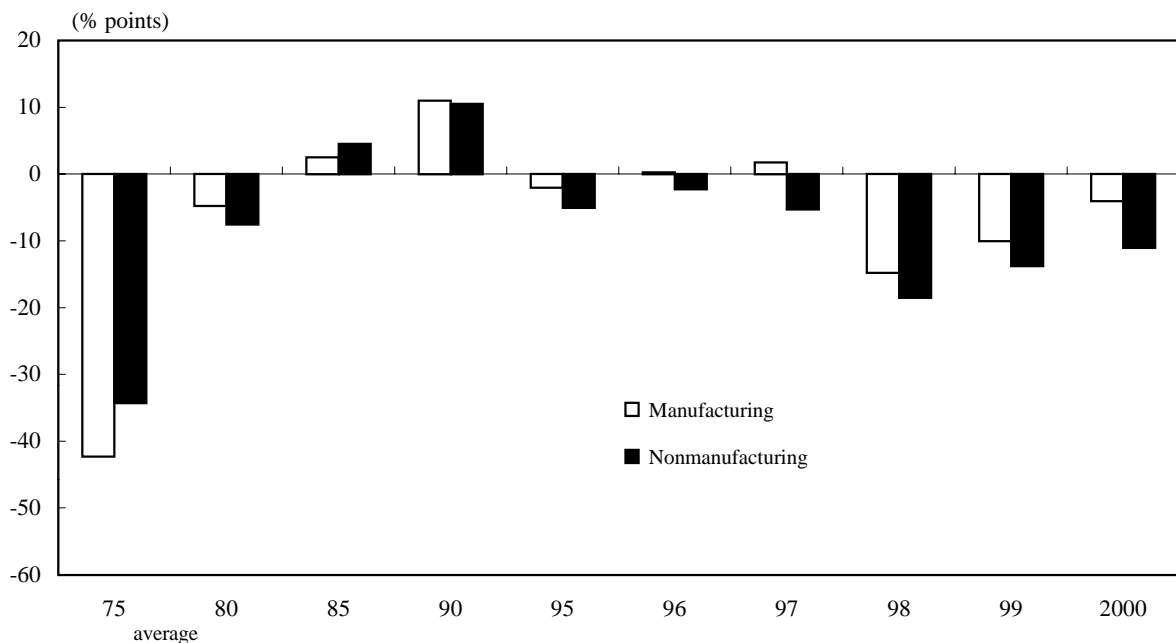
Dependency on Financial Institutions

(1) Ratio of Borrowing from Financial Institutions



Notes: 1. The ratio of borrowing from financial institutions is defined as "(short-term and long-term borrowings from financial institutions) / (total debt)."
 2. Data covers companies with stockholders' equity of 1 billion yen or more.

(2) Financial Position

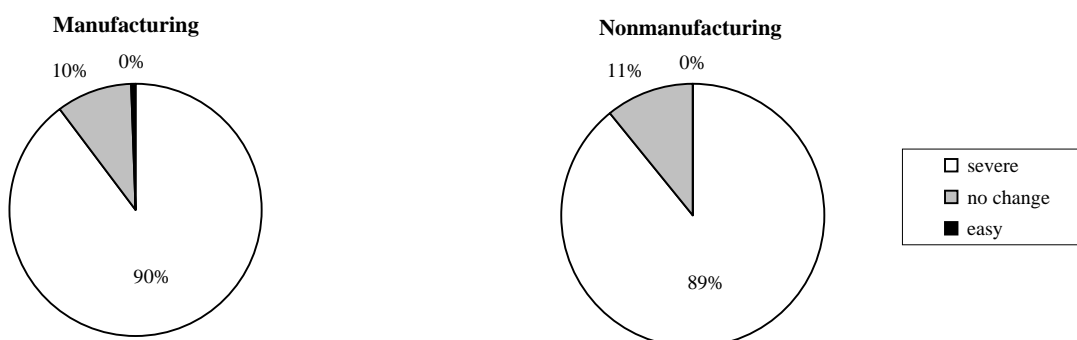


Notes: 1. Percentage of companies responding "easy" minus percentage of companies responding "tight."
 2. The data is based on *Tankan*, March 2000.

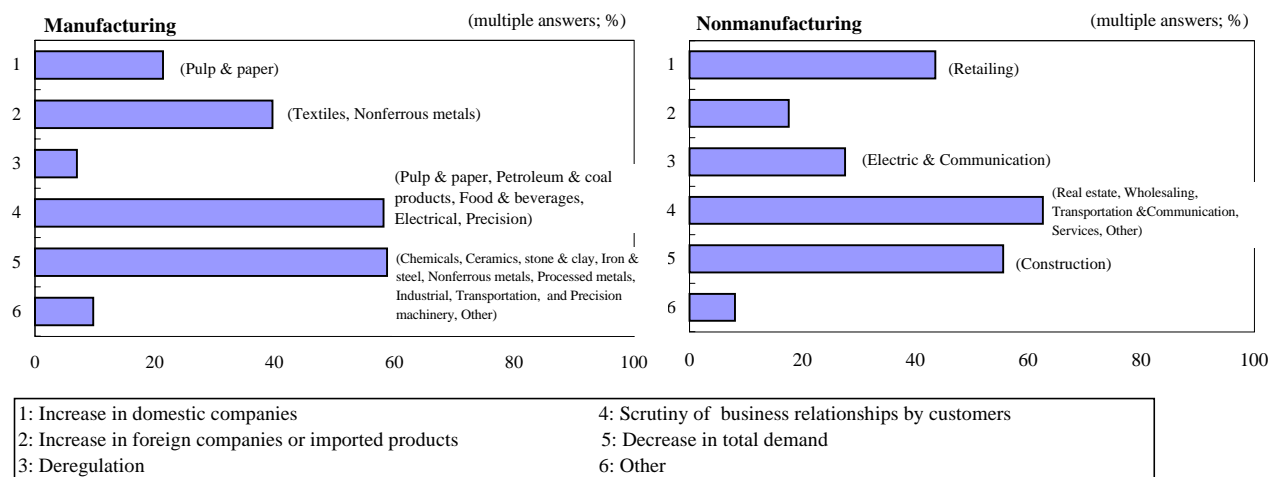
Sources: Ministry of Finance, "Financial Statements Statistics of Corporations by Industry, Quarterly."
 Bank of Japan, "*Tankan* Short-term Economic Survey of Enterprises in Japan."

Competition of Products

(1) Change in Product Competition (Comparison with 1996-97)

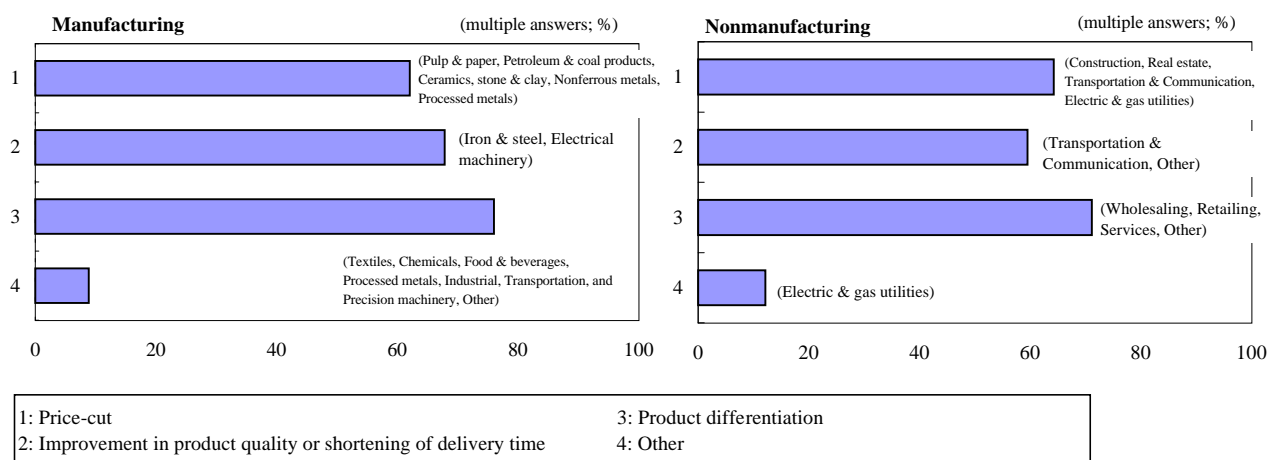


(2) Reasons Behind Severe Competition



Notes: The question allows multiple answers.
Industries in parentheses indicate the highest percentage response in each choice.

(3) Measures for Severe Competition



Notes: The question allows multiple answers.
Industries in parentheses indicate the highest percentage response in each choice.

Measures for "Severe Competition" and Putting Importance on "Rate of Return"

(1) Manufacturing

Measures for "severe competition"

Measures for putting importance on "rate of return"	Measures for "severe competition"			Total	Percentage of companies focusing on "rate of return" (Chart 6-2-2)
	a Product differentiation	b Improvement in product quality and shortening of delivery period	c Price cut		
Further increase in productivity and reduction in costs	160 (71%)	147 (65%)	137 (61%)	208 (92%)	247 <92%>
Product differentiation (without decreasing prices)	116 (51%)	94 (42%)	77* (34%)	127 (56%)	147 <54%>
Total	176 (78%)	155 (69%)	144 (64%)		
Percentage of companies responding "severe competition" (Chart 7-3)	250 <76%>	223 <68%>	204 <62%>		

* Electrical machinery	18 (23%)	→	Among 77 companies,	
Chemicals	12 (16%)		a+b+c	48
Industrial machinery	10 (13%)		a+c	19
			b+c	9
		c	1	

(2) Nonmanufacturing

Measures for "severe competition"

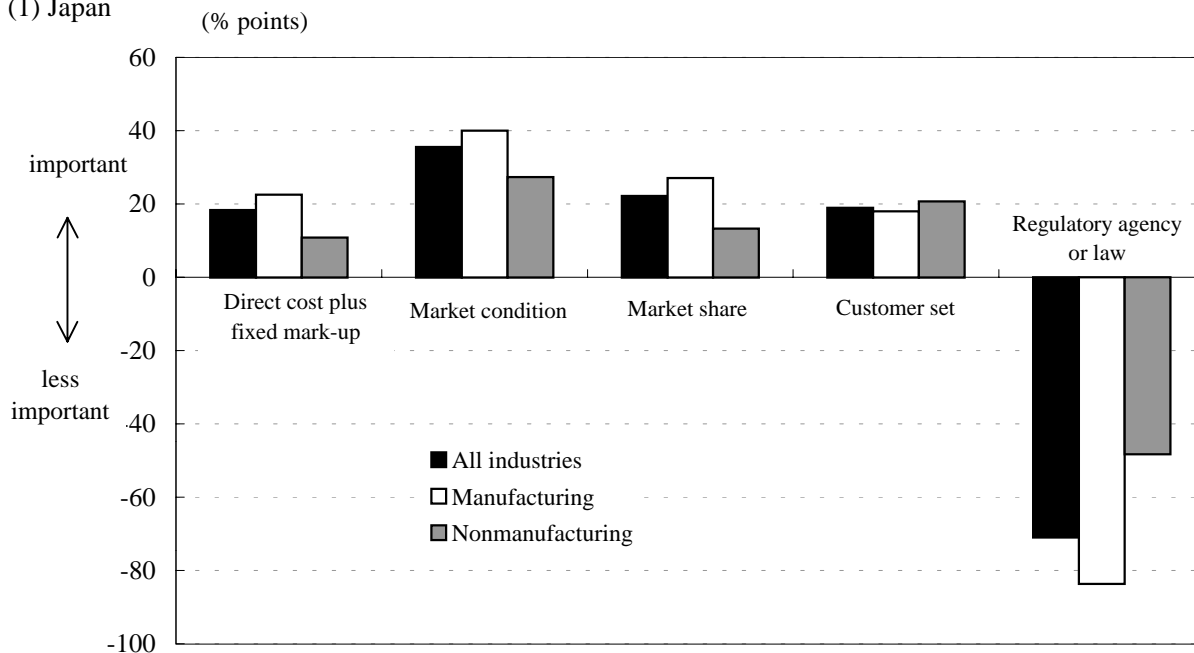
Measures for putting importance on "rate of return"	Measures for "severe competition"			Total	Percentage of companies focusing on "rate of return" (Chart 6-2-2)
	a Product differentiation	b Improvement in product quality and shortening of delivery period	c Price cut		
Further increase in productivity and reduction in costs	73 (62%)	57 (48%)	73 (62%)	109 (92%)	126 <90%>
Product differentiation (without decreasing prices)	36 (31%)	20 (17%)	27* (23%)	39 (33%)	50 <36%>
Total	81 (69%)	61 (52%)	81 (69%)		
Percentage of companies responding "severe competition" (Chart 7-3)	135 <71%>	113 <60%>	122 <64%>		

* Retailing	10 (37%)	→	Among 27 companies,	
Construction	7 (26%)		a+b+c	14
Real estate	3 (11%)		a+c	11
Wholesaling	3 (11%)		b+c	1
		c	1	

Note: Figures in parentheses are percentages to the number of companies that answered both (manufacturing: 226; nonmanufacturing: 118).

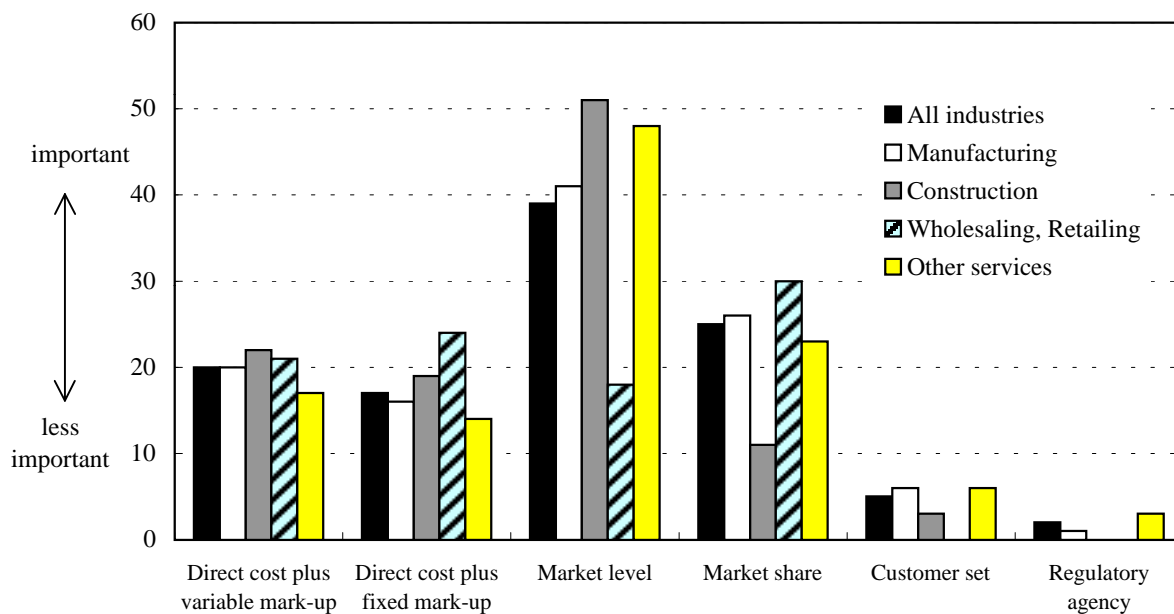
Factors Determining Price-Setting (Current)

(1) Japan



Note: DI = Percentage of companies responding "important" minus percentage of companies responding "less important"

(2) UK



Note: UK quoted from Hall *et al.* [1997].

Factors Determining Price-Setting by Industry (Current)

(Diffusion Index; % points)

Number of respondents (Response rate; %)	All industries		Manufacturing		Nonmanufacturing	
	600 (49.8%)		387 (50.3%)		213 (48.9%)	
	DI	Rank	DI	Rank	DI	Rank
Direct cost plus fixed mark-up	18.4	< 4 >	22.5	< 3 >	10.8	< 4 >
Market condition	35.6	< 1 >	40.0	< 1 >	27.3	< 1 >
Market share	22.2	< 2 >	27.1	< 2 >	13.2	< 3 >
Customer set	18.9	< 3 >	18.0	< 4 >	20.7	< 2 >
Regulatory agency or law	-70.9	< 5 >	-83.6	< 5 >	-48.2	< 5 >
Others (%)	1.7%		1.4%		2.3%	

Note: DI=Percentage of companies responding "important" minus percentage of companies responding "less important"

[Manufacturing]

<Rank>

	Number of respondents	(Response rate; %)	Direct cost plus fixed mark-up	Market condition	Market share	Customer set	Regulatory agency or law	Others (%)
Textiles	35	(70.0%)	2	1	4	3	5	2.0%
Pulp & paper	12	(70.6%)	2	1	2	4	5	0.0%
Chemicals	57	(41.9%)	2	1	3	4	5	0.7%
Petroleum & coal products	11	(57.9%)	4	1	2	3	5	10.5%
Ceramics, stone & clay	15	(62.5%)	1	2	2	4	5	0.0%
Iron & steel	27	(75.0%)	2	1	3	4	5	2.8%
Nonferrous metals	14	(60.9%)	4	1	2	3	5	4.3%
Food & beverages	32	(48.5%)	2	3	1	4	5	3.0%
Processed metals	15	(48.4%)	3	2	4	1	5	0.0%
Industrial machinery	48	(44.4%)	3	2	1	4	5	0.9%
Electrical machinery	64	(45.4%)	4	1	2	3	5	1.4%
Transportation machinery	28	(47.5%)	4	2	1	3	5	0.0%
Precision machinery	12	(60.0%)	3	1	2	4	5	0.0%
Other manufacturing	17	(42.5%)	3	2	1	4	5	0.0%

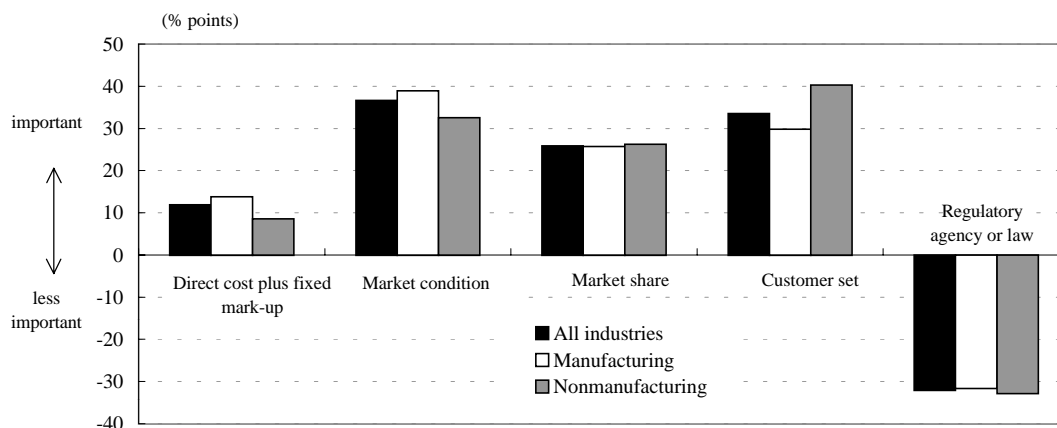
[Nonmanufacturing]

<Rank>

	Number of respondents	(Response rate; %)	Direct cost plus fixed mark-up	Market condition	Market share	Customer set	Regulatory agency or law	Others (%)
Construction	51	(44.3%)	4	2	3	1	5	0.9%
Real estate	12	(52.2%)	2	1	5	2	4	0.0%
Wholesaling	33	(44.0%)	4	2	3	1	5	2.7%
Retailing	44	(56.4%)	3	2	1	4	5	3.8%
Transportation & Communication	37	(57.8%)	3	2	4	5	1	1.6%
Electric & gas utilities	7	(50.0%)	2	5	4	3	1	7.1%
Services	25	(49.0%)	2	1	4	2	5	3.9%
Other nonmanufacturing	4	(25.0%)	4	1	1	1	5	0.0%

Factores Determining Price-Setting (Change)

(1) Change in Price-Setting Behavior (Comparison with 1996-97)



Note: DI = Percentage of companies responding "become important" minus percentage of companies responding "become less important"

(2) By Industry

(Diffusion Index, % points)

Number of respondents (Response rate; %)	All industries 597 (49.5%)		Manufacturing 385 (50.0%)		Nonmanufacturing 212 (48.6%)	
	DI	Rank	DI	Rank	DI	Rank
	Direct cost plus fixed mark-up	11.90	< 4 >	13.79	< 4 >	8.53
Market condition	36.64	< 1 >	38.89	< 1 >	32.52	< 2 >
Market share	25.90	< 3 >	25.73	< 3 >	26.21	< 3 >
Customer set	33.51	< 2 >	29.84	< 2 >	40.30	< 1 >
Regulatory agency or law	-32.05	< 5 >	-31.61	< 5 >	-32.83	< 5 >
Others	1.6%		1.2%		2.3%	

Note: DI = Percentage of companies responding "become important" minus percentage of companies responding "become less important"

[Manufacturing]

<Rank>

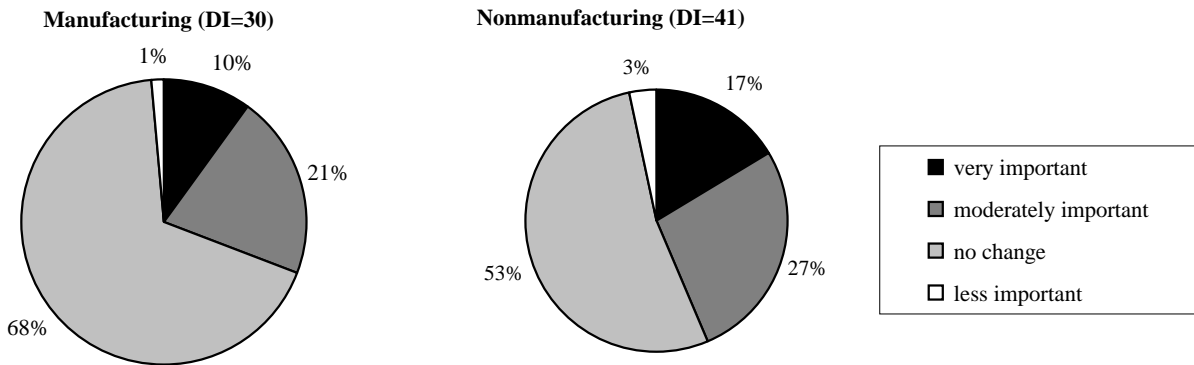
	Number of respondents	(Response rate; %)	Direct cost plus fixed mark-up	Market condition	Market share	Customer set	Regulatory agency or law	Others (%)
Textiles	35	(70.0%)	2	1	4	2	5	2.0%
Pulp & paper	12	(70.6%)	2	1	4	3	5	0.0%
Chemicals	56	(41.2%)	4	1	3	2	5	0.7%
Petroleum & coal products	11	(57.9%)	4	1	2	3	5	10.5%
Ceramics, stone & clay	15	(62.5%)	1	2	4	2	5	0.0%
Iron & steel	27	(75.0%)	3	1	4	2	5	2.8%
Nonferrous metals	14	(60.9%)	4	1	1	1	5	0.0%
Food & beverages	31	(47.0%)	3	4	1	1	5	3.0%
Processed metals	15	(48.4%)	4	2	3	1	5	0.0%
Industrial machinery	48	(44.4%)	4	2	1	3	5	0.9%
Electrical machinery	64	(45.4%)	4	1	3	2	5	0.7%
Transportation machinery	28	(47.5%)	4	1	3	2	5	0.0%
Precision machinery	12	(60.0%)	3	1	4	2	5	0.0%
Other manufacturing	17	(42.5%)	4	1	1	3	5	0.0%

[Nonmanufacturing]

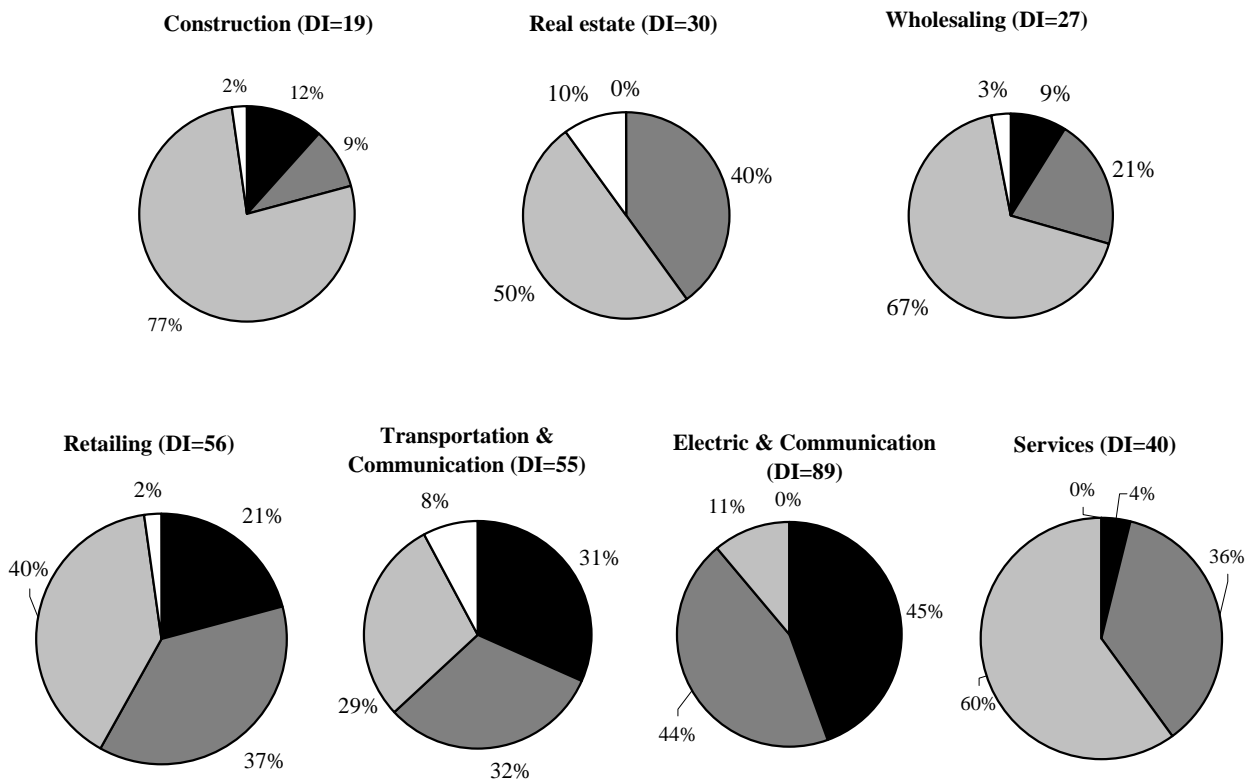
<Rank>

	Number of respondents	(Response rate; %)	Direct cost plus fixed mark-up	Market condition	Market share	Customer set	Regulatory agency	Others (%)
Construction	51	(44.3%)	4	2	3	1	5	0.9%
Real estate	12	(52.2%)	3	1	4	2	5	0.0%
Wholesaling	33	(44.0%)	3	4	2	1	5	2.7%
Retailing	43	(55.1%)	3	3	1	2	5	3.8%
Transportation & Communication	37	(57.8%)	4	1	3	2	5	1.6%
Electric & gas utilities	7	(50.0%)	4	3	2	1	5	7.1%
Services	25	(49.0%)	2	4	3	1	5	3.9%
Other nonmanufacturing	4	(25.0%)	4	2	1	2	5	0.0%

Pricing in Response to Customers, Specific Time, and Days



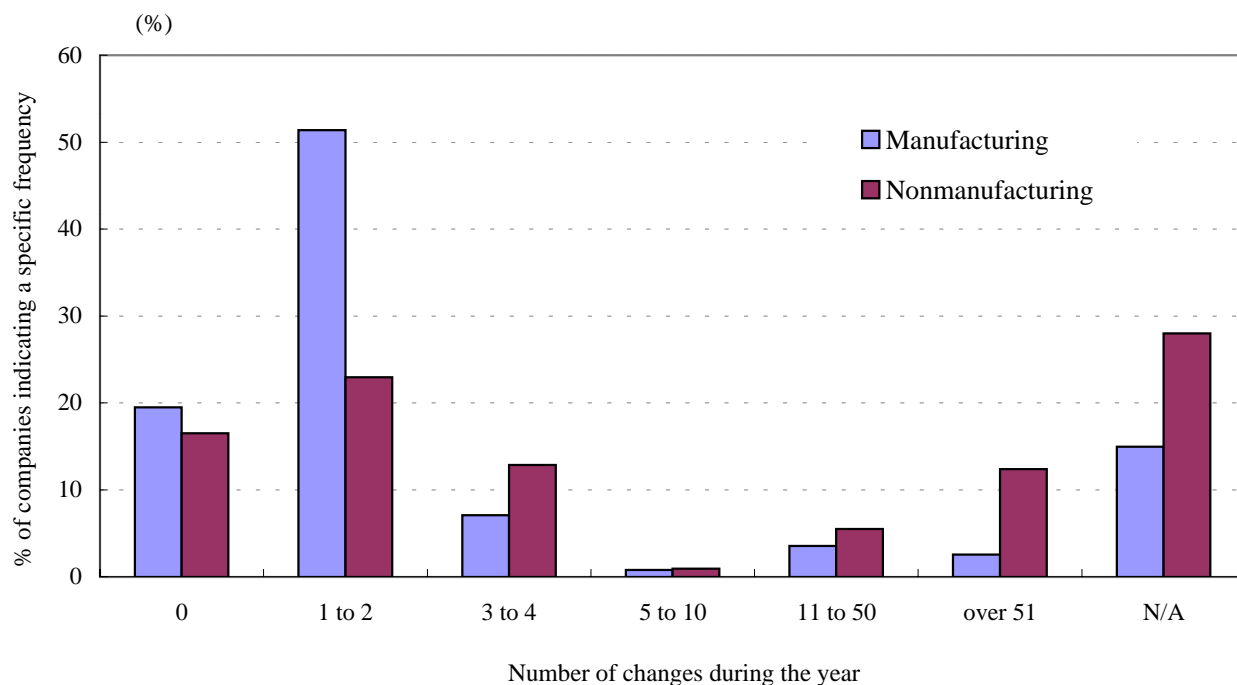
[Nonmanufacturing]



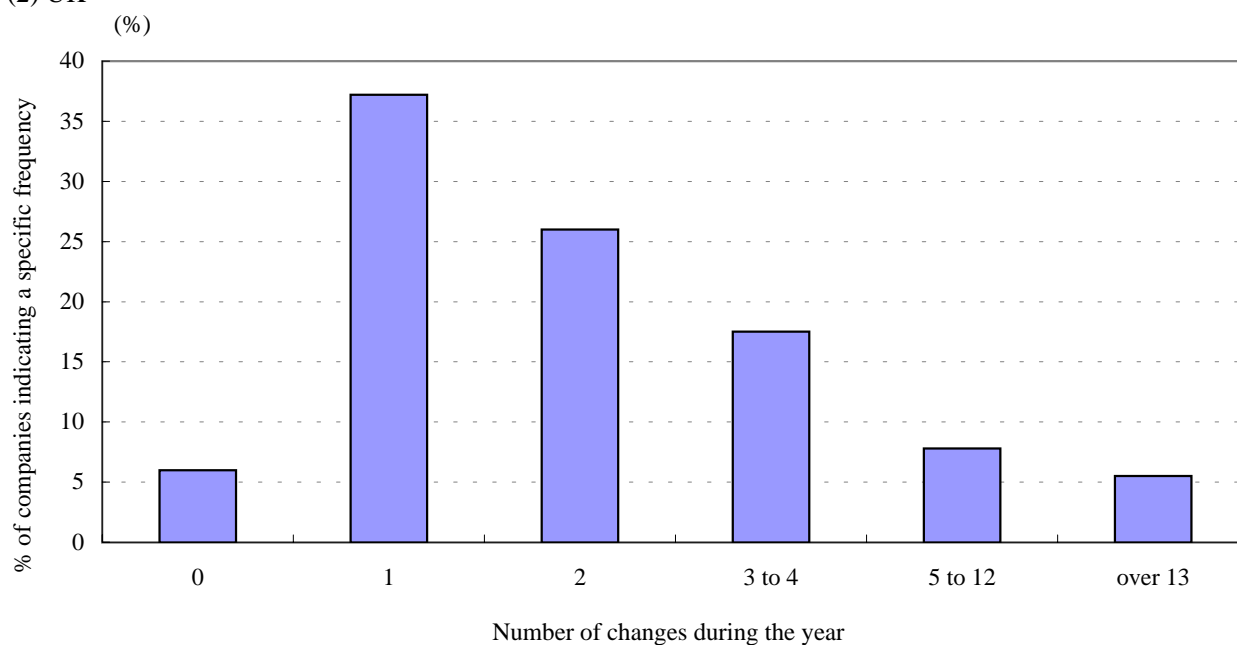
Note: DI = Percentage of companies responding "very important" and "moderately important" minus percentage of companies responding "less important"

Frequency of Price Change

(1) Japan



(2) UK



Note: Based on all industries.

Factors Explaining Price Rigidity (Current)

(1) Japan

		All industries		Manufacturing		Nonmanufacturing	
Number of respondents (Response rate: %)		620 (51.4%)		400 (51.9%)		220 (50.5%)	
Question	Theory	Mean	Rank	Mean	Rank	Mean	Rank
3-1	Explicit contracts	3.10	< 3 >	3.11	< 3 >	3.09	< 3 >
3-2	Implicit contracts	2.86	< 2 >	2.80	< 2 >	2.97	< 1 >
3-3	Procyclical elasticity	3.99	< 6 >	3.98	< 6 >	4.00	< 6 >
3-4	Co-ordination failure	2.86	< 1 >	2.74	< 1 >	3.08	< 2 >
3-5	Pricing thresholds	3.60	< 4 >	3.59	< 4 >	3.63	< 5 >
3-6	Menu costs	4.18	< 7 >	4.15	< 7 >	4.24	< 8 >
3-7	Delivery lags/service	4.35	< 9 >	4.35	< 9 >	4.35	< 9 >
3-8	Non-price elements	3.61	< 5 >	3.61	< 5 >	3.61	< 4 >
3-9	Price means quality	4.23	< 8 >	4.23	< 8 >	4.23	< 7 >

Note: Low scores indicate that the factor is very important (critical value=3: "moderately important").

(2) International Comparison

(i) All Industries (Japan, UK, and US)

Factor	Japan		UK		US	
	Mean	Rank	Mean	Rank	Mean	Rank
Explicit contracts	3.10	< 3 >	2.2	< 1 >	1.71	< 4 >
Implicit contracts	2.86	< 2 >	2.9	< 4 >	1.48	< 3 >
Procyclical elasticity	3.99	< 6 >	3.3	< 6 >	2.03	< 6 >
Co-ordination failure	2.86	< 1 >	2.5	< 2 >	1.15	< 2 >
Pricing thresholds	3.60	< 4 >	2.8	< 3 >	2.03	< 7 >
Menu costs	4.18	< 7 >	3.8	< 8 >	1.72	< 5 >
Non-price elements	3.61	< 5 >	3.3	< 5 >	1.14	< 1 >
Price means quality	4.23	< 8 >	3.6	< 7 >	2.55	< 8 >

Notes: 1. Low scores indicate that the factor is very important.

2. UK quoted from Hall *et al.* [1997] and US taken from Blinder [1991].

In order to compare with Japan and UK surveys, US data was subtracted from 4.

3. Common factors among three studies were chosen.

(ii) Ranking by Industry (Japan and UK)

(Rank)

Factor	Manufacturing		Construction		Retailing		Services	
	Japan	UK	Japan	UK	Japan	UK	Japan	UK
Explicit contracts	3	2	1	1	7	5	3	1
Implicit contracts	2	1	2	5	1	2	1	2
Procyclical elasticity	6	3	6	6	5	4	4	3
Co-ordination failure	1	6	3	4	2	3	5	7
Pricing thresholds	4	4	5	2	3	1	6	4
Menu costs	7	8	8	8	8	6	8	8
Non-price elements	5	5	4	7	4	8	2	5
Price means quality	8	7	7	3	6	7	7	6

Note: UK quoted from Hall *et al.* [1997].

Factors Explaining Price Rigidity (Change)

(Diffusion Index; % points)

Factor	All industries		Manufacturing		Nonmanufacturing	
	DI	Rank	DI	Rank	DI	Rank
Explicit contracts	4.7	< 3 >	4.3	< 3 >	5.5	< 3 >
Implicit contracts	8.6	< 2 >	5.3	< 2 >	14.7	< 1 >
Procyclical elasticity	-6.0	< 8 >	-5.5	< 9 >	-6.8	< 8 >
Coordination failure	9.7	< 1 >	9.5	< 1 >	10.0	< 2 >
Pricing thresholds	1.3	< 4 >	2.0	< 4 >	0.0	< 4 >
Menu costs	-2.9	< 7 >	-1.8	< 6 >	-5.0	< 7 >
Delivery lags/service	-2.5	< 6 >	-1.8	< 7 >	-3.8	< 5 >
Non-price elements	-1.8	< 5 >	-0.5	< 5 >	-4.2	< 6 >
Price means quality	-6.0	< 9 >	-4.5	< 8 >	-8.8	< 9 >

Note: DI = Percentage of companies responding "become important" minus percentage of companies responding "become less important"

Reference: Industries that rank first in each factor, except for "other manufacturing" and "other nonmanufacturing"

