

Firms' Perceptions of the Business Cycle and Their Managerial and Financial Conditions¹

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Abstract

Perception of the business cycle can differ among firms, which has been confirmed by extensive survey data. The question we want to answer in this paper is "What causes differences in business cycle perception?" by utilizing a newly designed questionnaire. Specifically, we match properties emphasizing the absolute level of economic activities or the direction of their changes and indicators of a firm's managerial and financial conditions, and examine the relationship between them. Based on our results, we could not find a particular indicator for the properties of firms that indicate level or trend change. However, a higher level of capital or number of employees suggests a tendency to emphasize change or rate of change, rather than the level of the business survey index. With regards to the time horizon of the business cycle, profit ratios (profit against sales or total assets) in general are good indicators. Firms with a high debt ratio tend to be myopic. Regression analysis shows that firms with high rates of investment/sales significantly tend to have a long-term vision.

¹ This article is based on a study first reported in the Asako, Ando and Matsumoto (2005), 'Kigyō no Keiki Handan to Keiei Zaimu Joukyō', *Financial Review*, Vol.78, pp.85-103 (in Japanese).

I. Introduction

When firms make plans for production, employment, fixed investment, financing and so on, it is extremely important for them to grasp the precise current and future state of the business cycle if they want to achieve good earnings. Because of this, a firm itself might apply resources to research, or collect information from governmental and private company's economic forecasts, and make use of this. Such efforts may form a perception of the business cycle or a firm's business sentiment that might not be the same among all firms, even among firms engaged in the same kind of business.

What causes this difference in the perception of the business cycle? Of course, it is likely that future events might not be very important for some firms, depending upon their activities. In addition, depending upon the precautionary measures taken, various short-run fluctuations or future uncertainty might not affect the judgment of a firm very much. Even if there is no apparent difference in these respects, it is still possible that firms' perceptions might differ. The purpose of this paper is to research the last point by making use of survey data from firms. The relevant survey is Mid-term and Long-term Behavior of Firms (hereinafter MLBF) and was conducted by the Research Institute of Capital Formation of Development Bank of Japan and the Institute of Economic Research of Hitotsubashi University, in December 2002.

More specifically, we match properties emphasizing absolute level or trend change in economic activities and indicators of a firm's managerial and financial conditions, and examine the relationship between them. We inquire into the mid-term and long-term behavior of firms in relation to ① financial strategy, ② governance, ③ research and development, ④ investment, ⑤ costs, and ⑥ business cycle. There are 39 questions in total. This survey data by the MLBF is reported in detail by Matsumoto (2003). For this paper, data comprising answers to questions related to the ⑥ business cycle are matched with managerial and financial indicators.

The structure of this paper is as follows: Section II is a preliminary discussion of perceptions of the business cycle. In particular, two perceptions are studied—judgment by level and judgment by trend or its change. We also survey representative indices of the business cycle. Section III introduces survey data on the judgments firms make on the business cycle contained in the MLBF. This data is the basis of statistical analyses in Section IV and Section V.

Section IV introduces a preliminary discussion of Section V, in which we review the state and the trend of the business cycle, and indicators of managerial and financial conditions of the firms in question. In Section V we research relationships from various statistical analyses among responses to the survey and indicators of managerial and financial conditions of the firms. Tools used in the statistical analysis are analysis of variance and regression. Section VI

concludes the paper with a caveat that statistically significant relationships between the business judgments of firms and managerial and financial conditions require further study.

II. Different Standards of Business Cycle Judgment – Level or Trend Change

Two different standards of business cycle judgment are investigated in this paper. This investigation relates to the perception of the current phase of the business cycle and it is also very important in determining the timing of changes in the phase of the business cycle.

From our experience, we know the business cycle index behaves cyclically, so that business cycle phase judgments show a certain theoretical relationship between those relying either on level or trend change of the economic activity. However, according to an analysis by Asako and Harada (2004), in reality, there is not necessarily a strong relationship between business cycle judgments based on level or trend change. This is also shown by the relationships among judgments of individual firms which responded to the relevant questionnaire. It is possible that perception is not very consistent.

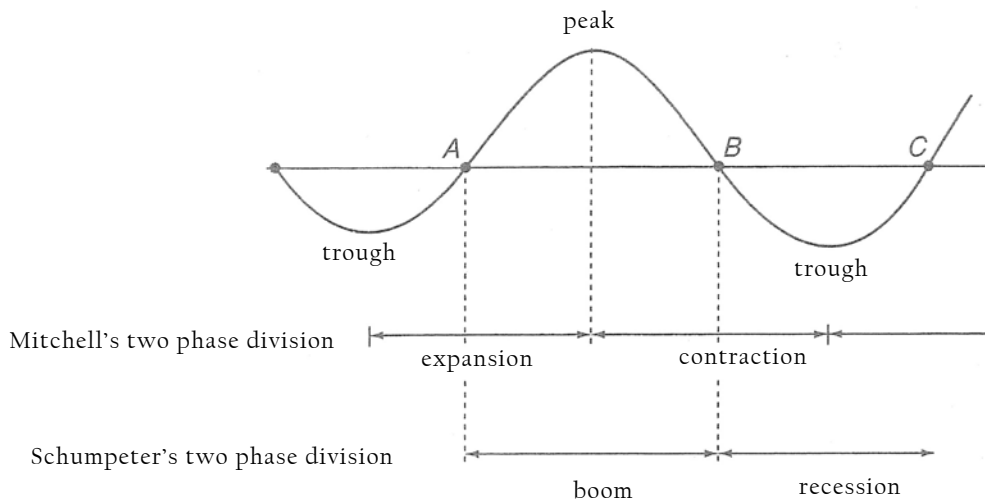
At any rate, provided that some firms perceive the business cycle by putting emphasis on level and others by putting emphasis on trend and its change, and that business survey indices are constructed from questionnaires aimed at such mixed firms, we have to know the implications in detail of the relationship between the business cycle indices and the firms' managerial and financial conditions.

II.1. *Phase division of business cycle*

There are basically two ideas regarding phase division in the business cycle. One is that one cycle consists of expansion and contraction, which is called Mitchell's two-phase division. As can be seen in Figure 1, expansion is from trough (bottom or floor) to peak (top or ceiling), and contraction is from peak to trough. One cycle is completed from trough to trough. In Japan the official business cycle dating by the Cabinet Office relies on this division and it is actually a fundamental judgment of good or bad business conditions.

The other phase division, known as Schumpeter's two-phase division, is boom and recession (or depression). Expansion and contraction relate to changing trends of an economy, whereas boom and recession relate to the level of economic activity. That is, in Figure 1 on the line at the center of the cycle, the area from point A to point B is a boom because economic activity is above the average level, while the area from B to C is a recession because it is below the average level.

Figure 1 Phase Division of Business Cycle



The problem is that there are differences in timing between the two two-phase divisions concerning good and bad sentiment of the business cycle. Conversely, if we recognize these differences correctly, we can utilize the information contained in level and trend change properly. For example, if the business cycle arose repeatedly by the exact sine curve regularity, the boom-recession two-phase division is followed by the expansion-contraction two-phase division by just a quarter of a cycle.

II.2. Formation of business cycle perception

How does an individual economic agent sense the business cycle, and form a perception of it? There is the basic problem as to what index or indicator should be used to grasp general economic sentiment. However, we omit this problem here, assuming there is a specified business cycle index.

An economic agent judges the surroundings to form a perception of the business cycle, but in reality it may not grasp the entire general macro economy, and individual economic agents in turn do not affect the macro economy either. However, like many small weight price setters in a monopolistically competitive market, it evaluates knowledge of the perceptions of other economic agents highly useful. Here we may find the origins of formal survey data.

Now, we return to our problem. When firms have a perception, which is emphasized, level or trend change? As Asako and Harada (2004) pointed out, and as is often the case, because a firm's main concerns are production, employment, purchase of raw materials, investment, financing, etc., it puts emphasis on future trends rather than present conditions. In this sense, firms are sensitive to changes in economic activity. In contrast, among households and

consumers, getting a job or consumption activities are the main concerns. They put emphasis on the present level of economic activity.

It is true that if both firms and consumers are rational, they should take future conditions into consideration. In this sense, a comparison of firms and consumers is a matter of degree. But, consumers are likely to be affected more by present economic conditions than firms. For example, liquidity constraints caused by an imperfect capital market could affect consumers often lacking collateral. A firm is a going concern whereas an individual has a finite life. Therefore, the time horizon and the rate of time preference might differ.

In general, there are some firms whose perception of the business cycle can be related more to the trend change approach of Mitchell and there are others whose perception can be related more to the level approach of Schumpeter. In actual fact, many firms are familiar with both. Which factors divide firms is a problem clarified with the MLBF survey in Section III and the statistical analyses that follow.

II.3. Survey data on business cycle perception

In this subsection, we introduce representative survey data on business cycle perception. It is not necessarily well known, but there is extensive survey data on the Japanese economy. The data from the Bank of Japan (BOJ) is well known. But, there is other survey data compiled by the Cabinet Office, Ministry of Finance, the Small and Medium Enterprise Agency, National Life Finance Corporation, etc. Moreover, the economy watchers survey (EWS) has been carried out since 2000, in which responses are provided by individuals who hold jobs. The general objectives of these surveys are introduced in detail by Asako and Harada (2004). From the viewpoints of level or trend change, these can be summarized as follows:

The BOJ's short-term economic survey of all enterprises in Japan (known as TANKAN by its Japanese abbreviation) has many questions, and research on business cycle perception is a "judgment item" category. In particular, "your business situation", which asks about the level of economic activity, receives answers in three ordered categories: "good," "not very good," and "bad," and is called the Business Judgment DI (diffusion index). Here, responses are aggregated as the percentage of the number of firms choosing the first answer less the percentage of the number of firms choosing the third answer; that is,

$$\text{Business Judgment DI} = \text{"good" ratio} - \text{"bad" ratio},$$

which theoretically extends from plus 100 percent to minus 100 percent.

On the other hand, the Ministry of Finance's business outlook survey is conducted on a large scale like TANKAN. But, unlike the TANKAN perception of the business cycle is investigated by inquiring about trend and its change. Firms choose from among "up," "same," and "down" to describe change compared to the previous term. Aggregation of the results provides the business cycle index, which is called the Business Survey Index (BSI). The aggregation method is

basically like TANKAN's Business Judgment DI, meaning that the BSI is constructed by the percentage of the number of firms choosing "up" less the percentage of the number of firms choosing "down,"

$$\text{BSI} = \text{"up" ratio} - \text{"down" ratio}.$$

Thirdly, the Cabinet Office started conducting the EWS in 2000. People working as sales staff, hotel staff, taxi drivers, etc. are hired as economy watchers. Every month, a judgment is made in terms of level (i.e. the situation this month is good or bad), trend change (better or worse compared to that three months before), and assessment of the business cycle at present and in the future (improving or worsening two or three months later). In relation to our problem, it is interesting that this survey asks people both about level and trend change when making a judgment on the business cycle. Hence, in principle we are able to examine the consistency of the respondents in forming perceptions of the current state and the changing direction of the future economic activity. Unfortunately, however, we are still at the stage of waiting for the accumulation of the economy watchers' survey data.

In passing it is noted that, because the EWS is conducted by the same Cabinet Office that officially decides the business cycle dating basing on the records of the historical diffusion index, the assessment by trend change is naturally adopted for official aggregation statistics, and the assessment by level is utilized only as a reference.

III. Survey Data on Assessments by Firms of the Business Cycle

How is the business cycle perceived by firms? We have already introduced the BOJ TANKAN, Ministry of Finance business outlook survey, and Cabinet Office economy watchers survey (EWS) in Section II for possible sources of scrutiny. The TANKAN Business Judgment DI is a survey of the level of the economic activity whereas the BSI of the business outlook survey is a survey of trend change. In addition, survey data on small and medium-sized firms investigated by Asako and Harada (2004) can be used for analyzing firms if individual answers are available. However, this is not the case as they are not available to academic researchers.

Because each survey has its respective restriction for our purpose, we decided to make inquiries directly to firms ourselves about the formation of a business cycle perception. Our purpose was to analyze the relationship between them and firms' managerial and financial conditions.

III.1. Survey data on mid-term and long-term behavior of firms

Our original survey was jointly designed and conducted by Research Institute of Capital Formation of Development Bank of Japan and Institute of Economic Research of Hitotsubashi University in December 2002, and was titled Mid-term and Long-term Behavior of Firms

(MLBF).

In MLBF we requested firms to answer 39 questions in six categories: ① financial strategy, ② governance, ③ research and development, ④ investment, ⑤ cost, and ⑥ business cycle. Detailed results were presented by Matsumoto (2003). In principle, we introduce the results that relate to our research problem.

In the survey, 2,372 listed domestic companies, excluding financial services companies (banks, securities companies, insurance companies) formed the survey population. They were requested to respond by mail, and 579 responses were received. For our analysis, we excluded six companies that were only listed locally, and also those that had been engaged in mergers or acquisitions during the previous four fiscal years, which left 532 companies. Most of our analysis is done using this 532 company sample, in principle, but in particular circumstances we use a smaller sample because certain questions were not answered for some other reason. In such cases we use a 442-company sample, for which there had not been much variation with respect to the settlement of accounts during the preceding 10 years.

There were four questions about the business cycle: question 36 asked to which business cycle index or indicator most attention was paid; question 37 asked whether the respondent put emphasis on level or trend change; question 38 asked what the respondent thought about the government judgment on the business cycle; and question 39 asked to what extent the respondent was interested in the time horizon of the future business phase.

In what follows, we introduce individual questions and confirm the results in all industries and separated results into manufacturing and non-manufacturing sectors. In some cases, the sum of the answers is not the same as the total because there were six anonymous companies among those that gave valid answers that could not be categorized by industry. As a result, they were included neither in manufacturing nor non-manufacturing categories.

III.2. Question 36: To which indicator is most attention paid?

Question 36: Which index or indicator is used for making a judgment on the business cycle?
Please choose up to three items.

1. Sales of your company
2. Sales of the industry to which you belong
3. GDP
4. Index of business conditions
5. Index of all industry activity
6. Index of industrial production
7. Unemployment rate
8. Job openings to applicants ratio
9. Average stock price index
10. TANKAN (in particular:)
11. Judgment of think tanks (in particular:)
12. Others (mainly:)

Table 1: Answers to Question 36

	all industries		manufacturing		non-manufacturing	
	number of firms: 530		number of firms: 303		number of firms: 227	
	number of answers	share(%)	number of answers	share(%)	number of answers	share(%)
answer 1	243	17.5	138	17.4	105	17.7
answer 2	394	28.4	235	29.6	159	26.8
answer 3	106	7.6	61	7.7	45	7.6
answer 4	183	13.2	99	12.5	84	14.2
answer 5	26	1.9	10	1.3	16	2.7
answer 6	81	5.8	61	7.7	20	3.4
answer 7	52	3.8	26	3.3	26	4.4
answer 8	12	0.9	6	0.8	6	1.0
answer 9	181	13.1	98	12.4	83	14.0
answer 10	59	4.3	30	3.8	29	4.9
answer 11	23	1.7	12	1.5	11	1.9
answer 12	26	1.9	17	2.1	9	1.5
sum of answers	1386	100.0	793	100.0	593	100.0

Various responses were received because up to three multiple answers were permitted. The five major responses were: sales of the industry to which you belong (28.4%), sales of your company (17.5%), index of business conditions (13.2%), average stock price index (13.1%), GDP (7.8%). The rank and the share of these are almost the same when we divide the sample into manufacturing and non-manufacturing except that for manufacturing the response rate for index of industrial production (IIP) was almost as high as GDP.

Industry's sales received more emphasis than own sales. This means firms are concerned about other firms when they form a perception of the business cycle, but they do not watch the macro-economy in general much beyond the condition of their own industry. Few companies put much emphasis on GDP, IIP, unemployment rate, or job openings to applicants ratio. Index of all industry activity (IAA) is highly rated by specialists in business cycle forecasting because it covers the non-manufacturing sector, meaning that the coverage is broader than that of IIP, and that reporting is prompter in comparison to GDP. But, it was presumably not chosen here by many companies because it is not well known.

What was made clear by this survey and is interesting is that the TANKAN and the judgments of think tanks do not receive much attention. In addition, the index of business conditions is ranked third at best. This being the case, it can be concluded that as a general tendency macro economic indices do not receive much attention.

Finally, the fact that unemployment rate and job openings to applicants ratio do not receive attention deserves attention. There is a contrast between these and the result of the average stock price. In general, the indicators of the labor market lag behind the business cycle and the index of the stock market leads the business cycle. Then the result here may be coincidental because, in the next section, we refer to the fact that the phase of the business cycle in December 2002 was the beginning stage of the post war 14th expansion, starting from January 2002.

III.3. Question 37: Level and trend change

Question 37: "When you use the business cycle index as the basis for making managerial decisions, which do you think is important, level or trend change (rate of change)?"

1. Level, 2. Trend change or rate of change, 3. No difference (or hard to tell the difference)

Table 2: Answers to Question 37

	all industries		manufacturing		non-manufacturing	
	number of firms: 524		number of firms: 299		number of firms: 225	
	number of answers	share(%)	number of answers	share(%)	number of answers	share(%)
answer 1	93	17.7	43	14.4	50	22.2
answer 2	179	34.2	107	35.8	72	32.0
answer 3	252	48.1	149	49.8	103	45.8
sum of answers	524	100.0	299	100.0	225	100.0

The responding companies comprised those engaged in all industries (524), manufacturing (299), and non-manufacturing (225). We can find "trend change or rate of change" in one-third of all categories, so that a good number of firms turn out to perceive the business cycle from trend change or rate of change. It is true that more non-manufacturing companies tend to form a business cycle perception by level than manufacturing companies, but at best a little more than 20%. As for all industries, the percentage of level chosen is 17.7%.

However, both in manufacturing and in non-manufacturing sectors, about half of the companies answered "no difference" including the responses of "hard to tell the difference." So, we cannot find a dominant tendency for level or trend change at this stage.

III.4. Question 38: Evaluation of business cycle judgment of government

Question 38: "How do you evaluate the business cycle judgment regularly announced by the government? Please choose from among the following five ranks: "

1. appropriate and reliable, 2. so-so, but can be used for reference, 3. neither appropriate nor inappropriate, meaningless, 4. not appropriate, not applicable, 5. very unreliable

Table 3: Answers to Question 38

	all industries		manufacturing		non-manufacturing	
	number of firms: 527		number of firms: 303		number of firms: 224	
	number of answers	share(%)	number of answers	share(%)	number of answers	share(%)
answer 1	3	0.6	2	0.7	1	0.4
answer 2	199	37.8	108	35.6	91	40.6
answer 3	224	42.5	139	45.9	85	37.9
answer 4	82	15.6	43	14.2	39	17.4
answer 5	19	3.6	11	3.6	8	3.6
sum of answers	527	100.0	303	100.0	224	100.0

This question requests an evaluation of the governmental business cycle judgment. To begin with, regardless of manufacturing or non-manufacturing, the two extremes of "appropriate and reliable" and "very unreliable" received few responses; that is, biased evaluations of the government were rarely seen. Second, "neither appropriate nor inappropriate, meaningless" accounted for about 40%. Whether we should accept this result as literally neutral or as negative may be a subtle issue.

Third, comparing two evaluations that are not extreme: "so-so, but can be used for reference" and "not appropriate, not applicable", the former positive response accounted for 37.8% and the negative latter response 15.6% for all industries. The positive evaluation is more than twice as common as the negative response. There is no difference between manufacturing and non-manufacturing sectors.

III.5. Question 39: Time horizon of business cycle

Question 39: To what extent are you interested in the business cycle?						
1. Within 1 quarter, 2. 1 quarter to half a year, 3. Half a year to one year, 4. 1 year to 2 years, 5. 2 years to 5 years, 6. More than 5 years."						

Table 4: Answers to Question 39

	all industries		manufacturing		non-manufacturing	
	number of firms: 526		number of firms: 300		number of firms: 226	
	number of answers	share(%)	number of answers	share(%)	number of answers	share(%)
answer 1	8	1.5	1	0.3	7	3.1
answer 2	20	3.8	12	4.0	8	3.5
answer 3	162	30.8	103	34.3	59	26.1
answer 4	180	34.2	100	33.3	80	35.4
answer 5	138	26.2	74	24.7	64	28.3
answer 6	18	3.4	10	3.3	8	3.5
sum of answers	526	100.0	300	100.0	226	100.0

From the answers to question 39 about the time horizon, we find that the main concern is for the period from half a year to 5 years. It is natural that less than half a year or more than 5 years are outside the scope of interest. Within the area of main concern, half a year to 1 year, 1 to 2 years, and 2 to 5 years are comparable. But, when observed in detail, the situation is different for manufacturing and non-manufacturing sectors with about "half a year to one year" and "2 years to 5 years," respectively. As for manufacturing, "half a year to one year" exceeds "2 years to 5 years" by about 10%. As for non-manufacturing, "2 years to 5 years" exceeds "half a year to one year" by a small margin.

According to Iidsuka and Asako (2003), the post-war Japanese business cycles (from the 2nd one to the 13th one) extend for about 50 months on average. The expansion period is 33 months and the contraction period is 17 months. Hence, in the expansion period within two years (strictly, average persistent period $33/2 = 16.5$ months), and in the contraction period within one year, we come to the turning points of business cycles. It is wise to be concerned about "1 year or more than 2 years" from the viewpoint of preparing for this change.

IV. Business Cycle Judgment and Managerial and Financial Conditions – Preliminary Discussion

In the next section we analyze what managerial and financial factors are related to firms' perception of the business cycle. Prior to this, we offer a preliminary discussion in this section.

IV.1. Phase of business cycle when the survey was conducted

First, we look at the phase of the business cycle when the MLFB survey was conducted. As discussed by Matsumoto (2003), each firm responded to most of the questions from mid-term and long-term viewpoints. But, concerning questions related to the business cycle, because of its character, it is possible that answers were affected by the state of the business cycle at the time they were given. We review the phase of the business cycle around December 2002 and the succeeding situation up to the present time.

Question 36 indicates that firms take account of various indicators, so that which indicator we should use to judge the business cycle phase is a fundamental problem. We should pay due attention to this problem, but for now, we adopt the two most general indices—the Index of Business Conditions and the GDP—which are commonly used across industries.

IV.1.1. Index of Business Conditions

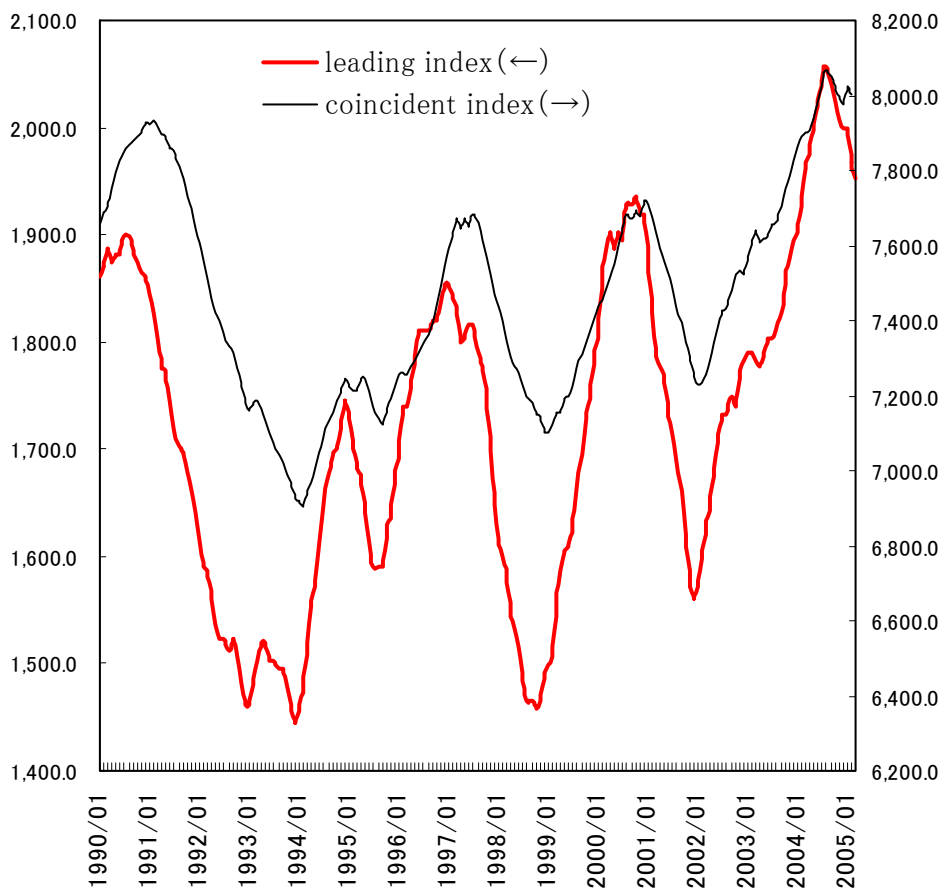
First, in Figure 2 we review the coincident index (cumulated diffusion index) from the

Indexes of Business Conditions of the Cabinet Office. Beginning in August 1960, this index was prepared by the Economic Planning Agency (now Cabinet Office), and a newly revised one has been used since October 2004. Following this revision, only department store sales were changed for commercial sales (retail) in the coincident index.

Just before our survey, in January 2002, the state of the business cycle was at a trough and the coincident index took the figure as low as 7,271, and a recovery had just started. But, as is often said, the sentiment of firms lags behind the statistical trend of the Index of Business Conditions by several months, and sometimes more than one year. In addition, because unexpected slowdowns (October 1993, January 1999) occurred in the recovery process after the asset-inflation led bubble era, people were not convinced that the recovery was firmly established. Ex post, the cumulated coincident index continued to expand until August 2004, and was in a small recession at the beginning of 2005.

In Figure 2, we also plot the leading index in addition to the coincident index. The leading index is devised to lead the movement of the coincident index by several months, which may or may not actually be the case in Figure 2.

Figure 2 Diffusion Index (Cumulated DI)

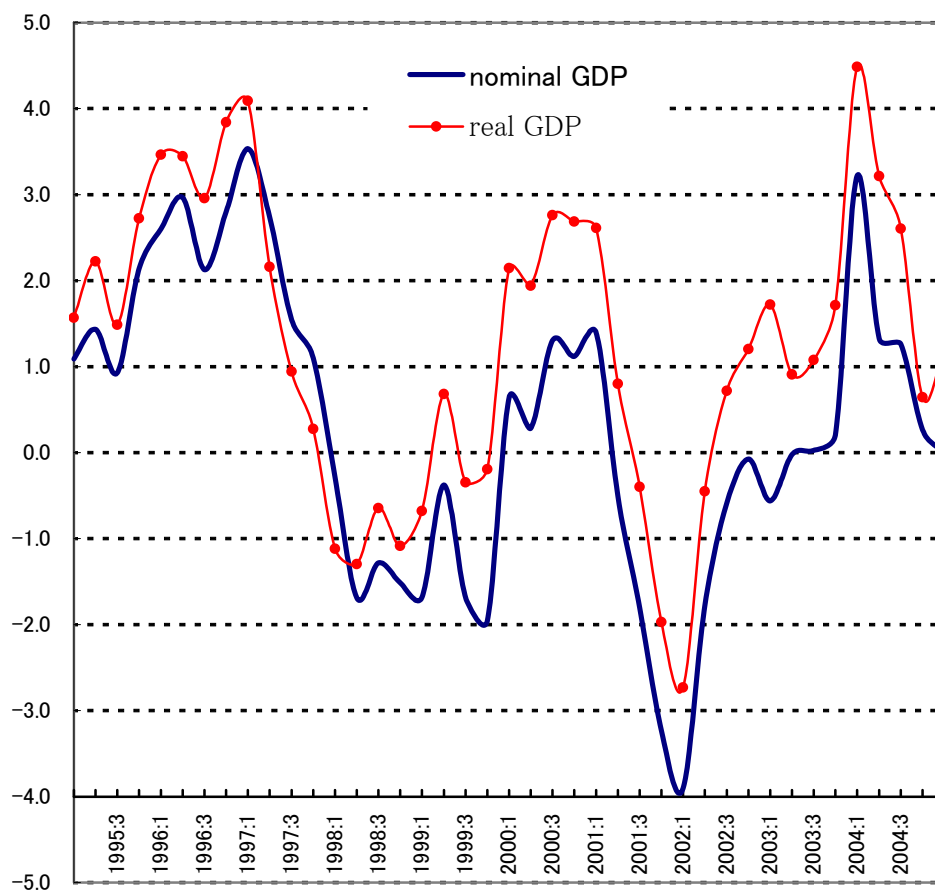


IV.1.2. Growth rate of GDP

Next, we turn to the growth rate of GDP. In relation to the business cycle, it is common to monitor real GDP, but first we look at nominal GDP. There are two reasons for this. Firstly real values depend on the way the price deflator is constructed, from which nominal value is free. And secondly in a closer look price decreases have not been negligible recently, and the nominal value which reflects them is more appealing during the days of deflation as an indicator of the business cycle. In Figure 3 we also plot real GDP growth rate.

Overall, both nominal and real growth rates have not exhibited such different trace records. We find that around 2002;2Q – 2003;1Q, which is the period covered by the survey, the negative growth rate was decreasing in absolute value. But, since it was at any rate a period of negative growth, firms could not be optimistic about the phase of the business cycle. Since 2005, the situation has improved a little, reaching just over the zero level.

Figure 3 GDP Growth Rates



IV.1.3. Business cycle dating and stock prices

As we have confirmed, both Index of Business Conditions and GDP growth rate show that the phase of the business cycle was recovering, but this future course was not yet certain when the survey was conducted. In fact, the Cabinet office made an interim conclusion in June 2003 (decisive conclusion was made as late as November 2004) that January 2002 marked the trough of the cycle.

The stock market was also in a slump as can be seen in Figure 4. The TOPIX rose at first in 2002, but in mid-2002 it fell, and this tendency continued until March 2003, recording a low of 770.62. That is, people in the stock market were not aware of the recovery, but were rather pessimistic about the future because of the prolonged bad loan problems of the financial institutions, the stagnant competitiveness of the Japanese economy, and so on.

Figure 4 TOPIX and Deal (2000–2004)



IV.2. *Managerial and financial indicator*

We used data for firms that answered questions about the business cycle. As we have stated, for MLFB we collected effective answers from 579 domestic firms, which do not include financial services companies (banks, securities companies, and insurance companies). For this paper, we analyze 532 companies that answered at least one question about the business cycle and for which four years of annual reports were available, because new start-ups and companies engaged in mergers and acquisitions activities were avoided. We also use a sample of 442 firms typified by the stability of past management and financial performances. Hereafter, we refer to the former as the “all-sample” and the latter as the “sub-sample”

In this section, to explore the properties of these firms, we briefly outline management and financial indicators. As discussed by Okuno and Yamada (1978), Furukawa (1980), and more recently by Ganguin and Bilardello (2005) in relation to the rating of firms, management and financial indicators of firms are often classified into four categories: growth, profitability, stability, and others. Thus, we follow the traditional criterion to focus on growth, profitability, and stability.

IV.2.1. *Growth and profitability*

First, we review the growth and the profitability of the firms by looking at sales and profits, which are shown in Table 5. These figures are averages from fiscal year 1999 to 2001.

In all industries, sales increased a little and operating profit increased, but current profit decreased by nearly 30%, with pre-tax profit and after-tax profit decreasing sharply. In the manufacturing sector, sales decreased a little, and operating profit increased by 14.1%. In the non-manufacturing sector, sales increased by 1.7%, but operating profit decreased by 1.0%. Although the decrease of 30% in current profit is common to both sectors, pre-tax and after-tax profit decreased more sharply in the non-manufacturing sector.

Next, to review the profitability of the responding firms, their various profit rates for the previous year, *i.e.*, fiscal year 2001, are shown in Table 6. The ratio of operating profit to sales is 3.9% for all industries, 2.9% for manufacturing, and 5.3% for non-manufacturing. This tendency is similar for business profit rate (business profit = operating profit + received interest and dividend). The after-tax profit ratio to sales for the non-manufacturing sector is 0.7%, but for the manufacturing sector it is minus 1.9%, and across all industries it is minus 0.8%.

Stock-based profit rate, namely ratio against assets, has the same tendency as flow-based profit rate such as profit sales ratio because total assets and sales are closely correlated with each other.

Table 5: Average Growth Rate for the Past Three Years (1999–2001)

	sales	operating profit	current profit	pre-tax profit	after-tax profit
all industries	0.6%	7.6%	-28.4%	-167.8%	-231.1%
manufacturing	-0.3%	14.1%	-28.0%	-133.0%	-182.1%
non-manufacturing	1.7%	-1.0%	-29.0%	-214.5%	-296.9%

Table 6: Profit Rates (FY2001)

	operating profit /sales	project profit. /sales	current profit /sales	after-tax profit /sales
all industries	3.9%	4.5%	3.7%	-0.8%
manufacturing	2.9%	3.7%	3.0%	-1.9%
non-manufacturing	5.3%	5.7%	4.6%	0.7%

	operating profit /total assets	project profit /total assets	current profit /total assets	after-tax profit /total assets
all industries	3.1%	3.5%	3.0%	-0.1%
manufacturing	2.4%	2.9%	2.5%	-0.7%
non-manufacturing	3.9%	4.2%	3.8%	0.7%

IV.2.2. Stability

Next, from the viewpoint of stability when the survey was carried out, we are interested in the status of outstanding debt and it was as shown in Table 7. The ratio of debt to equity is 371.6% for all industries, 320.1% for the manufacturing sector and 440.7% for the non-manufacturing sector, which are high. As a result, the rate of paid interests to sales in the manufacturing sector is 0.8%, which is lower than that in the non-manufacturing sector (1.2%), although the rate of paid interests to debt is higher in the manufacturing sector.

Table 7: Financial Ratios (FY2001)

	debt/capital stock	paid interests/sales	paid interests /interest-paying debt	sales/debt
all industries	371.6%	1.0%	4.0%	1.89
manufacturing	320.1%	0.8%	4.1%	1.81
non-manufacturing	440.7%	1.2%	3.8%	2.00

IV.2.3. Scale: capital stock and number of employees

To check the properties of firms, scale provides important information, as well as managerial

and financial indicators. Here, we take up capital stock or stock capitalization and number of employees as proxies for the scale of a firm. The distribution of these statistics is more important than the average. Here, we check quantile values.

For all industries, capital stock is distributed from 186.1 to 676,400 million yen and the average is 15,620 billion yen. The first quantile is 2,519 million yen, the second quantile (median) is 6,420 million yen, and the third quantile is 15,620 million yen. The average is increased by the presence of a few large-scale companies.

The tendency is basically the same for the number of employees. The minimum is 28 (non-consolidated basis), the maximum is 59,041, and the average is 1,959. The first quantile is 361, the second is 811, and the third is 1,661. Some companies do not report the number of employees (non-consolidated basis), so these can cause the average to fall. However, there is only one company of this kind among the 532 responding companies, so its effect is minimal. Because this company has about 14,000 employees, the average is smaller than the real value.

V. Business Cycle Judgment and Managerial and Financial Conditions

In this section, we perform a statistical analysis using individual data from the MLFB survey. As was explained in the previous section, this survey allots four questions to the business cycle themes. Of these, question 37, which deals with level and trend change of economic activity, and question 39, which deals with time horizon are appropriate for investigating judgments made of the business cycle or formation of business cycle phase perception.

V.1. Level and trend change

According to the answers to question 37, we confirm whether or not business cycle judgments based on the level of economic activities or the trend change are related systematically to managerial and financial indicators of firms.

① ANOVA (all sample, size=524)

We divide responding firms into three categories: "1. level," "2. trend change or rate of change," "3. no difference," and check whether managerial and financial indicators are statistically different between the groups. We checked 23 indicators—sales, operating profit, current profit, pre-tax and after-tax profit (all of these are the annual rate of change in fiscal year 2001), capital stock, number of employees, debt to capital ratio (all of these are for FY2001), paid interests/sales, paid interests/debt, operating profit/sales, business profit/sales, current profit/sales, after-tax profit/sales, investment/sales, operating profit/total assets, business profit/total assets, current profit/total assets, after-tax profit/total assets, increase of

securities/total assets, investment/total assets and sales/debt (flow indicators are for FY2001, stock indicators are at the end of FY2000).

Unfortunately, the result of the ANOVA (analysis of variance) is that most of these managerial and financial indicators are not significant. Only the growth rate of operating profit (p-value=0.098) and that of capital stock (p-value=0.073) and investment/total assets (p-value=0.099) are significant with a scant 10% significance level.

Looking at the growth rates for one year, three years, five years, and 10 years, we find no large differences in the results. When we divide all industries into manufacturing and non-manufacturing sectors, three-year profit (operating, current, business)/sales in the non-manufacturing sector becomes significant with a 1% significance level and answers differ in accordance with growth rates. That is, a firm with profit increasing in the past three years tends to choose 1 (level is important), a firm with profit not changing tends to choose 2 (trend change or rate of change), and a firm with profit decreasing tends to choose 3 (no difference).

These tendencies suggest the story of a firm whose profit rate is not initially high and which makes an effort to increase profits, but when it comes to the phase with a high profit rate, the level of profit becomes important. However, this kind of relationship is observed only among non-manufacturing firms and for three-year profit rate, implying that the obtained result is not robust.

② ANOVA (sub-sample, size=439)

We executed the same ANOVA for the sub-sample 442 firms (to be exact 439 for question 37) that did not undergo large changes over 10 years. The growth rate of operating profit and investment/total assets ratio are no longer significant, although they were significant for the 524 firm all-sample. But, capital stock is still significant and the significance level is higher (p-value is 0.057). The number of employees is also significant (p-value is 0.048).

In Table 8, depending on the answers to question 37, we compute the mean and standard deviation of capital stock and number of employees. We may conclude from these results that larger firms choose to judge the business cycle conditions not by level but by trend change or rate of change.

Table 8: Capital Stock and Number of Employees by Groups

answer	number of firms	capital stock		number of employees	
		mean	standard deviation	mean	standard deviation
1	76	174.8	61.3	1,802	444
2	158	305.1	42.5	2,664	308
3	205	178.7	37.3	1,684	270

note) Capital stock's unit is one million, number of employee's unit is one person.

V.1.1. Analysis using logit model

Assuming the answers from the three responding groups provide qualitative categorical data, we estimate a logit model. The dependent variable takes 1 (level), 2 (trend change), and 3 (no difference) and the explanatory variables are managerial and financial indicators. However, as was the case with the result of ANOVA, there were almost no significant explaining variables.

In relation to many estimations for all-sample and sub-sample, in general, more significant estimations are found in manufacturing and machinery (sum of general, electric, transportation, and precision machinery) industry. We tried to make an estimation industry-by-industry for the sub-sample. We also eliminated the ambiguous answer 3 (no difference), and estimated a probit model by focusing on answers 1 and 2. We omit a detailed explanation, but the result shows there are some remarkable relationships, especially concerning the machinery industry.

For example, when adding the constant term, growth of sales (compared to the value 10 years ago), current profit rate (compared to the value three years ago), and own capital ratio (compared to the value three years ago), p-values are, respectively, 0.039, 0.035, and 0.022, which are significant with a 5% probability level. That is, high growth companies, high profit-rate companies, and high own capital ratio companies tend to put emphasis on trend change or rate of change.

The result—that an estimation by industry is better than that for all industries— may be caused by a large industry-by-industry variance.

V.2. Time horizon of business cycle

Next, using the answer to question 39, we consider the relationship between time horizon (to how far in the future firms are concerned) and managerial and financial conditions of the firms.

① ANOVA (all-sample=526)

As with the ANOVA analysis of question 37, we divide the 526 responding firms into six groups by time horizon, and check if there are any significant differences in managerial and financial indicators among the groups. There are 23 indicators, which are the same as those for question 37.

The result of ANOVA for all 525 firms is that 11, or almost half of the indicators, are significant with a significance level of 5%, which is in contrast with the result for question 37. A 1% significance result was obtained for eight indicators: operating profit/sales (p-value=0.000), business profit/sales (p-value=0.000), current profit/sales (p-value=0.002), operating profit/total assets (p-value=0.000), business profit/total assets (p-value=0.000), current profit/total assets (p-value=0.001), after-tax profit/total assets (p-value=0.010) and increase of securities/total assets (p-value=0.001). A 5% significant result was obtained for three indicators: investment/sales (p-value=0.031), debt/capital (p-value=0.033), and after-tax profit/sales (p-value=0.037).

Concerning the ratio of profit against sales or total assets, as profit rate increased, the time horizon becomes longer. This becomes clearer from Table 9, which shows the results for the sub-sample 438 firms, but the qualitative nature is almost the same as for the all-sample 526 firms here.

② ANOVA (sub-sample=438)

The ANOVA results of the sub-sample of 442 firms (for question 39, 438) are similar to the results for the case of 526 firms. However, some points can be noted:

First, a new 5% significant indicator is paid interest/sales (p-value=0.023), while on the other hand, significance decreased for after-tax profit/total assets (p-value=0.094). The increases of securities/total assets (p-value=0.644) and after-tax profit/sales (p-value=0.110) were not significant even at a 10% level but were significant at 1% and 5%, respectively, for 526 firms. However, 10 indicators are still significant, so that firms' time horizon is considered to be closely related to their managerial and financial indicators.

According to Table 9, concerning profit as a ratio of sales or total assets, the time horizon becomes longer according as the profit rate becomes higher. And, as the debt ratio becomes higher, the time horizon becomes shorter. Paid interests and repayment of debt might have priority over other items, thus shortening the time horizon. Namely, the time horizon can be thought of as a means for moderating and solving the *pro tempore* or immediate constraints. In other words, when the profit rate becomes low or the debt ratio becomes high, perhaps firms cannot afford to think about a long-term management plan, but rather have to finance current operations, thus rendering the increase in the rate of time preference.

Of course, strictly speaking, causality is an open question. Concerning conventional consumer choice theory and firm profit maximization theory, the parameters regulating the underlying utility function and the production function are dealt with as deep parameters, which are given not by economic reasoning but by other non-economic factors. That is, normal causality means that the managerial and financial situations of firms do not affect their time horizon, but the time horizon does affect performance. However, the real facts do not appear to be as theory suggests. In this sense, our results show that causality is contrary to what is normally assumed.

Table 9: Mean and Standard Deviation of Financial Index by Answers

		operating profit /sales		operating profit/total assets		debt/capital stock		paid interests/sales	
answer	number of firms	mean	Standard deviation	mean	Standard deviation	mean	Standard deviation	Mean	Standard deviation
1	6	3.24	2.90	3.01	1.60	3.21	8.27	0.72	0.59
2	17	2.05	1.72	1.69	0.95	20.36	4.91	0.93	0.35
3	135	2.10	0.61	1.85	0.34	2.36	1.74	0.90	0.13
4	146	3.07	0.59	2.49	0.32	4.57	1.68	0.99	0.12
5	121	4.80	0.65	3.01	0.36	3.70	1.84	1.13	0.13
6	13	11.88	1.97	6.50	1.09	1.78	5.62	2.38	0.40

Note) Debt/capital stock is ratio, others are %.

V.2.1. Result of regression analysis

Here, we perform a regression analysis based on the ANOVA results. Question 39 asks to what extent firms are concerned about the business cycle in terms of concrete time spans. We quantify the answers in such a way as to assign the following average numbers on the basis in general of assuming the uniform distribution over the designated time span: "within a quarter"= 0.125, "a quarter to half a year"= 0.375, "half a year to 1 year"= 0.75, "1 to 2 years"= 1.5, "2 to 5 years"= 3.5 and "over 5 years"= 5. Based on these figures, we check whether the score is related to managerial and financial indicators by conducting a regression analysis.

On a 532 firm basis, one by one simple regression analyses show that the results provided by ANOVA are reconfirmed and satisfactory. Namely, current profit/sales, current profit/total assets, and investment/sales are all 1% significant with positive sign parameters. A multiple regression analysis, which was done for regressing on current profit/sales and investment/sales at a time and reported in Table 10, also shows that both parameters are positive, with the former being 1% significant and the latter being 5% significant.

Estimated regression coefficient implies that 10% point higher current profit/sales means that the time horizon is longer by 0.23 year (2.7 months) and 10% point higher than investment/sales means that the time horizon is longer by 0.06 year (0.8 month).

Table 10: Multiple Regression of Time Horizon

	coefficient	standard error	p-value
constant	1.686	0.070	0.000
current profit / sales	2.281	0.865	0.009
investment / sales	0.644	0.278	0.021
R ²	0.032		

V.2.2. Time horizons among industries

Finally, let us look at time horizon differences among industries. The all-sample 526 firms show there is a difference, which is shown in the composition ratio on Table 11.

First, comparing manufacturing and non-manufacturing sectors, we find no apparent large difference, but there is a small difference between answer 1 "within a quarter" and answer 3 "half a year to one year." That is, almost no responses are found for answer 1 in the manufacturing sector but 3.1% is found in the non-manufacturing sector. A detailed analysis turns out that a very short time horizon is not utterly rare among transportation/storehouse and wholesale/retail firms. As for answer 3, manufacturing sector records 34.3% and non-manufacturing sector records 26.1%, with a large difference of 8.2%.

Second, we can find some industries whose time horizon is in sharp contrast with the average feature. Here are some examples: Few firms answer 4 "1 to 2 years" in textile and pulp/paper industries, while few answer 3 "half a year to 1 year," and more answer 4 "1 to 2 years" instead in the transportation machinery and precise machinery industry. We also find that few firms answer 3, and more answer 5 "2 to 5 years" in the electricity/gas industry.

Third, we find more answer 6 "more than 5 years" in electricity/gas and transportation/storehouse industries 9.1%, machinery industry 8.3%, real estate/services industry 6.7% and chemicals/medicine industry 6.5%.

Table 11: Time Horizon, Answering Share by Industry

number of answers / share	sum of answers	answer 1	answer 2	answer 3	answer 4	answer 5	answer 6
all industries	526	1.5	3.8	30.8	34.2	26.2	3.4
manufacturing	300	0.3	4.0	34.3	33.3	24.7	3.3
food	34	0.0	2.9	38.2	29.4	29.4	0.0
textile	20	0.0	0.0	60.0	5.0	35.0	0.0
pulp / paper	5	0.0	0.0	60.0	0.0	40.0	0.0
chemicals / medicine	46	0.0	4.3	30.4	37.0	21.7	6.5
oil / coal products / ceramic	16	0.0	6.3	31.3	43.8	18.8	0.0
steel / metal / metal products	38	0.0	10.5	21.1	31.6	34.2	2.6
general machinery	48	0.0	2.1	35.4	41.7	12.5	8.3
electric machinery	42	0.0	2.4	40.5	33.3	21.4	2.4
transportation machinery	25	4.0	0.0	16.0	44.0	36.0	0.0
precision machinery	6	0.0	16.7	16.7	66.7	0.0	0.0
other products	20	0.0	5.0	45.0	20.0	25.0	5.0
non manufacturing	226	3.1	3.5	26.1	35.4	28.3	3.5
fishing / agriculture / mining	7	0.0	0.0	28.6	14.3	57.1	0.0
construction	53	1.9	0.0	26.4	37.7	34.0	0.0
electricity / gas	11	0.0	0.0	18.2	27.3	45.5	9.1
transportation / storehouse	33	6.1	3.0	27.3	18.2	36.4	9.1
wholesale / retail	76	3.9	5.3	26.3	43.4	19.7	1.3
communication	1	0.0	0.0	0.0	100.0	0.0	0.0
real estate / service	45	2.2	6.7	26.7	35.6	22.2	6.7

VI. Conclusion

This paper uses survey data about the mid-term and long-term behavior of firms obtained from research designed and carried out by Research Institute of Capital Formation of Development Bank of Japan and Institute of Economic Research of Hitotsubashi University in December 2002. We analyzed answers to business cycle perception questions, and investigated the relationship with the managerial and financial conditions of firms.

As a result, we could not find a particular index or an indicator, by which firms put emphasis on level or trend change, but we did find that larger companies (in terms of capital stock or number of employees) tend to view trend change or rate of change. Regarding the degree to which firms are interested in the business cycle, we find a long time horizon for high profit ratio companies either against sales or total assets. As for the debt capital stock ratio, companies with a high ratio tend to look only towards the near future. According to a regression analysis, high investment/sales companies tend to have significantly long time horizons.

We searched factors which characterize firms' perception of the business cycle and found different aspects depending on individual firms, but were not necessarily successful in finding statistically robust results except for a few features. Different aspects might naturally suggest

that some systematic factors are left unresolved. Our remaining task, then, is to check other aspects of firms such as corporate governance, manager's characteristics, employment characteristics, and the locality to which firms belong, etc., in addition to the factors of managerial and financial indicators and industrial properties.

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