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**Job Creation and Job Destruction in Japan, 1978 – 1998:**
**An Empirical Analysis Based on Enterprise Data**

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# Contents

# Job Creation and Job Destruction in Japan, 1978 – 1998
## An Empirical Analysis Based on Enterprise Data

## Summary

1.    The low-level unemployment rate once boasted of by Japan rose to 5% through the double-dip recession that has hit Japan following the collapse of Japan's bubble economy. Despite the fact that the immediate momentum of the rise has waned, Japan's employment situation remains severe. During 1998 and 1999, the country witnessed the unprecedented phenomenon of a decline in the number of individuals employed. This did not mean that firms *en masse* reduced the number of jobs, for some firms increased the size of their work force. Moreover, in the current debate swirling around employment policies there is a concern not merely about curbing unemployment – interest in creation of job opportunities has increased, and the need for an analysis of job creation at the firms that represent the demand side for labor has grown. This report probes the principal factors that effect job creation and job destruction, using enterprise-level data that forms the core of management decision-making.

2.    Throughout Japan there are both firms that create jobs and firms that eliminate jobs, but because employment statistics are published on an aggregate basis it is only possible to grasp the net increase or decrease in employment. It is possible to observe the gross job creation and job destruction occurring "behind the scenes", so to speak, by tracing the statistics backwards to individual firms. We divided the increase in employees at firms that expanded employment and the decrease in employees at firms that reduced employment, respectively, by the total number of employees at the beginning of designated time periods for all firms, to create values we defined as the "Job Creation Rate" and the "Job Destruction Rate". We calculated these rates for listed and publicly traded companies for the past 20-year period. Both the Job Creation Rate and the Job Destruction Rate for all listed and publicly traded companies hovered at approximately 2% during the 1980s. During the bubble era, however, the Job Creation Rate leapt to the 3% level, while the Job Destruction Rate fell below 1%. Since the collapse of the bubble economy, however, the Job Creation Rate has declined to about the 1% level and the Job Destruction Rate has risen to more than 3%, causing a reversal to a net decline in employment.

3.    Looking at the Job Creation Rate and the Job Destruction Rate by industrial sector, until the beginning of the 1990s the Job Creation Rate in the services, wholesale and retail, and machinery industries such as electric machinery was high, which pushed up overall employment. During the bubble era, the Job Creation Rate in the construction sector and manufacturing sectors except machinery also jumped, but after the collapse of the bubble economy the Job Creation Rate fell in every industrial sector and the Job Destruction Rate also rose. Amidst these changes the Job Creation Rate for sectors such as services and wholesale and retail has been over 1%.
    Looked at by firm size, the smaller the enterprises the higher the Job Creation Rate. The Job Destruction Rate at small firms was also high at the start of the 1980s. Since then, however, the

Job Destruction Rate at large firms has increased relatively, and in the latter half of the 1990s the Job Destruction Rate has been highest at large firms employing more than 5,000 individuals. When examined by company age, the tendency is for younger firms to have a higher Job Creation Rate and lower Job Destruction Rate. Looked at by the average age of company employees, in general the Job Creation Rate is high and the Job Destruction Rate is low when the average age of employees is low. While we were unable to confirm whether there is a relationship between the average wages of employees and the Job Creation Rate and Job Destruction Rate, there is a tendency for the Job Creation Rate to be higher to the extent the average wage is low.

Overall the Job Creation Rate rose and Job Destruction Rate fell during the bubble era, regardless of the size of the firm, the age of the company or the average age or average wages of employees. This singular characteristic of the bubble era was especially evident in long-established firms or firms where the average employee age was high, and the lack of labor force demand in these firms after the collapse of the bubble economy is remarkable.

4.    When the principal causes of employment changes are analyzed on an individual firm basis using estimates based on enterprise data from listed and publicly traded companies, revenue growth is found to have a meaningful positive value and business expansion forms an important factor in job growth. The average age of workers and the company age also generally show meaningful negative values, and we found that firms where the burden of personnel expenses has grown because the workforce has aged, or well-established companies with low growth, are companies that had to retrench on employment. Moreover, during the 1990s the debt ratio showed a meaningful negative value, and we believe that a firm's financial condition has increased in importance concerning decisions regarding employment.

5.    We next investigated whether there is a move on the part of listed and publicly traded companies to substitute regular employment with low-cost, highly flexible temporary employment when employees leave because of retirement age or layoffs. The following results were attained.

When looked at by number of employees, in many cases temporary employment is being creating at enterprises where regular employment is growing and the number of firms substituting regular employment with temporary employment is not very large. Looked at by number of enterprises, however, a move to substitute temporary employment is plainly evident, and more than half of all firms that have been increasing temporary employment since the later half of the 1990s have been reducing regular employment. This move towards substitution can be readily seen in firms where the average age of employees is high or at firms where the average wage level is high.

6.    The above shows that the factors influencing job creation include expansion of a firm's business activity, company financial health, comparatively small size, the number of years since the company was founded and the average age of the company's work force. In order to improve the Job Creation Rate, therefore, it will be important to cultivate young firms that possess strong growth potential, promote the commercialization of creative and unique ideas through measures such as deregulation, or create an environment that promotes new business start-up activity.

This research concerned calculation of the Job Creation Rate and Job Destruction Rate from 1978 through 1998, using microdata from listed and publicly traded Japanese companies, and an examination of the factors that influence changes in employment. In addition we also investigated whether there is a move by listed and publicly traded companies to substitute regular employment with temporary employment, which is more advantageous for firms from the standpoint of low cost and high flexibility, when employees leave because of retirement age or layoffs.

## Introduction

It has frequently been said that Japan has a stable, low level of unemployment, but this common knowledge has continued to crumble through the double-dip recession that has hit Japan since the collapse of the bubble economy. After Japan's the unemployment rate rose to 2% in 1976 in the wake of the first oil shock, the rate remained at the 2% level for approximately 20 years until the first half of the 1990s. This does not suggest that there were no changes to the unemployment rate during that entire 20-year period. Although the unemployment rate rose gradually from about 1980, reaching 2.9% (annual average, all figures cited below are the same) in 1987 and briefly even reaching 3%, during the bubble years the unemployment rate reflected the shortage of workers and began to fall, declining to 2.1% in 1990. Following the collapse of the bubble economy, however, the unemployment rate began to climb once again, reaching 3.2% in 1995 and eventually remaining at the 3% level. Once the 3% level was breached, the rise in the unemployment rate became remarkably rapid. The second recession following the collapse of the bubble economy since the spring of 1997 ranks with the first oil shock in severity and has had a tremendous impact on the labor market. The unemployment rate in 1998 was 4.1%, meaning that after reaching the 3% level in 1995 the rate climbed above 4% in just 3 years, leapt to 4.7% in 1999 and stands today at 5%.

Behind the rapid rise in the unemployment rate lies the unprecedented phenomenon witnessed during 1998 and 1999of a decline in the number of individuals employed. This was not seen even during the recession after the first oil shock. This does not mean that firms *en masse* reduced the number of their employees, for some firms increased the size of their work force. Faced with the current severe employment situation, therefore, it is particularly important to probe the characteristics of firms that either increased or decreased employment. Moreover, in the current debate swirling around employment policies it is not merely a question of groping for measures to maintain employment and curb unemployment – interest has grown in the more aggressive theme of *creating* job opportunities. The need for an analysis of job creation at the firms that represent the demand side for labor has therefore grown. This report probes the principal factors that effect job creation and job destruction, using the enterprise-level data that forms the core of management decision-making.

This report is organized into two chapters. In chapter I, indicators referred to as the "Job Creation Rate" and the "Job Destruction Rate" are used to examine the characteristics of firms that increased or destroyed employment opportunities during the period from 1978 through 1998, based on data for listed and publicly traded firms. Chapter I also considers the factors that influence a firm's decision-making regarding increases and decreases in employment, using a simple change in employment decision model.

In chapter II we turn our attention to the trend for temporary employment, which is showing remarkable growth. Principal factors on the labor supply side, such as the increase in need for part-time or second jobs by married women participating in the labor force or younger workers, have long been regarded as important causes for the rise in temporary employment.

Since about 1998, however, factors on the demand side for labor have begun to grow in importance, pointing to the possibility that attractive choices such as lower cost and higher flexibility than with regular employees are growing stronger for firms. The purpose of this chapter is to use enterprise data to investigate whether there is indeed a movement to substitute regular employment with temporary employment.

Finally, in the conclusion we take the above analysis into consideration to touch upon some ideas for countermeasures designed to reinvigorate job creation.

# I Job Creation and Job Destruction

## 1. Concepts and Measurment Issues

Throughout Japan there are both firms that can create jobs and firms that eliminate jobs, but because employment statistics are published on an aggregate basis it is only possible to grasp the net increase or decrease in employment. It is possible to observe the gross job creation and job destruction occurring "behind the scenes", so to speak, by tracing the statistics backwards to individual firms.

Research concerning job creation and job destruction based upon data at the level of the individual enterprise or business establishment was first vigorously addressed in Europe and the U.S. at the end of the 1980s. The work that played a trailblazing role in this effort was the research on job creation and job destruction in the U.S. manufacturing industry conducted by Dunne, Roberts and Samuelson (1989). Davis and Haltiwanger (1992) and Davis, Haltiwanger and Schuh (1993) also conducted similar research, which verified that while the change in employment may not appear great when viewed on a net basis, behind the aggregate totals the differences in job creation and job destruction were different by orders of magnitude. All of the research indicated above was based upon the database that contains data on individual business establishments in the U.S. called the Longitudinal Research Database (LRD).

Examples of representative research carried out in Japan include Genda (1997, 1998) and Higuchi and Shimpo (1998a). For this pioneering research, the researchers conducted empirical analysis of job creation and job destruction based upon separate data for business establishments from the Ministry of Labor's the *Employment Trend Survey*. Research regarding Japan's manufacturing industry includes work such as Morikawa and Tachibanaki (1997), based upon the separate tables in the *Census of Manufactures* put out by the Ministry of International Trade and Industry (MITI) [1].

The OECD (1996) carried out comparative research on job creation and job destruction during this same period for the 18 member countries of the OECD, which showed that compared to other advanced nations, job creation is low in Japan. Table 1-1 shows a data excerpt taken from that study for six leading nations.

The research for this paper was modeled on the research methods of Davis, Haltiwanger and Schuh (1996) or Genda (1997, 1998) and Higuchi and Shimpo (1998a). The terminology used for the analysis and the indicators are defined below. All Japanese enterprises were classified into a group of firms that increased employment and a group of firms that decreased employment. The total increase in employment of the group of enterprises that increased employment is referred to as "job creation" and the total decrease in employment of the group of enterprises that decreased employment is referred to as "job destruction". The job creation figures in Period $t$ may include cases of employment increased during Period $t$ by firms that already existed at the end of Period $t$-1, and cases of employment created by firms that were newly established or started doing business during Period $t$. Similarly, the job destruction figures in Period $t$ may include cases of employment being reduced during Period $t$ by firms that already existed at the end of Period $t$-1, and cases of employment being reduced by firms that went bankrupt, were dissolved or otherwise stopped doing business during Period $t$. Because an analysis of newly-established firms

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[1] In addition to the empirical research on job creation and job destruction based upon microdata that is introduced in this paper, other examples are the research by Higuchi and Shimpo (1998b) using the separate tables from MITI's *Basic Survey of Japanese Business Structure and Activities* and the analysis conducted by the Kansai University Institute of Economic and Political Studies (1989) on a business establishment-basis covering 90 manufacturing companies using each company's marketable securities reports. The results of research conducted to-date are compiled in detail in Kiyota and Kimura (1999).

or bankrupt or closed firms is difficult because of the quality and limitations of the data, for this study we used only the job creation or job destruction figures of firms that remained in business over the term analyzed. For reference a conceptual illustration of this selection is shown in Figure 1-1.
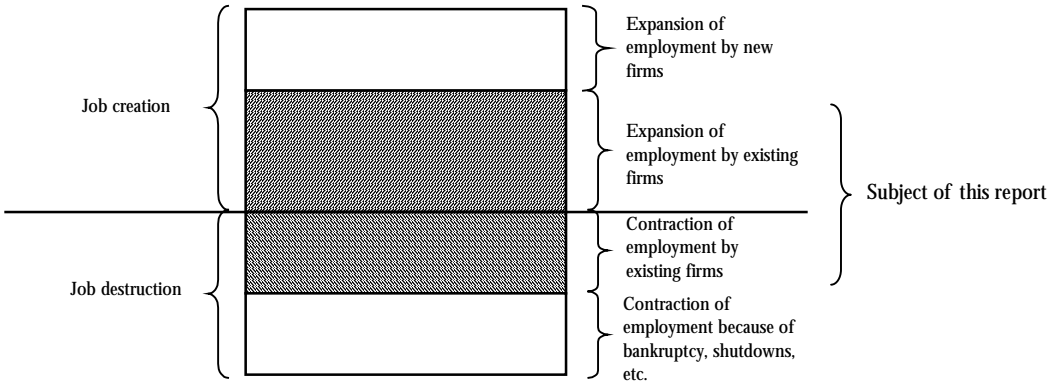
We defined the Job Creation Rate, or JCR, as the total increase in the number of employed individuals in the enterprise group that increased employees in Period $t$ (job creation) divided by the total number of individuals employed by all firms at the start of Period $t$. We defined Job Destruction rate, or JDR, as the total decrease in the number of employed individuals in the enterprise group that decreased employees in Period $t$ (job destruction) divided by the total number of individuals employed by all firms at the start of Period $t$. Subtracting the Job Destruction Rate from the Job Creation Rate gives a rate of employment increase or decrease that can be confirmed even using statistics on an aggregate basis, which we called the employment Net Creation Rate, or NCR. Combining both rates provides the Job Reallocation Rate, or JRR, which is one indicator that shows the size of labor force movement.

### Table 1-1.   Job Creation and Job Destruction in Individual Countries

(Unit: %)

| | | Japan | U.S. | Germany | France | Canada | England |
|---|---|---|---|---|---|---|---|
| Period (Years) | | 91 – 94 | 84 – 91 | 83 – 90 | 84 – 91 | 83 – 91 | 85 – 91 |
| Job Creation Rate | | 7.4 | 13.0 | 9.0 | 12.7 | 14.5 | 8.7 |
|     Firm start-ups | | 4.0 | 8.4 | 2.5 | 6.1 | 3.2 | 2.7 |
|     Employment increase at existing firms | | 3.4 | 4.6 | 6.5 | 6.6 | 11.2 | 6.0 |
| Job Destruction Rate | | 7.9 | 10.4 | 7.5 | 11.8 | 11.9 | 6.6 |
|     Firm shutdowns | | 3.3 | 7.3 | 1.9 | 5.5 | 3.1 | 3.9 |
|     Employment decrease at existing firms | | 4.6 | 3.1 | 5.6 | 6.3 | 8.8 | 2.7 |
| Net Creation Rate | | -0.5 | 2.6 | 1.5 | 0.9 | 2.6 | 2.1 |
| Job Reallocation Rate | All locations | 15.3 | 23.4 | 16.5 | 24.4 | 26.3 | 15.3 |
| | Existing locations only | 8.0 | 7.7 | 12.1 | 12.9 | 20.0 | 8.7 |

Notes:  1.   Excerpted from OECD (1996), Higuchi and Shimpo (1998a)

2.   Figures for Japan are from Higuchi and Shimpo (1998a); all other figures are from OECD (1996).

3.   Data are not comparable on a unit basis because the data for Japan, the U.S., France and Germany were calculated using business establishment-level data, while the data for Canada and England were calculated from enterprise-level data.

4.   Annual average ratios for the respective years shown.

### Figure 1-1.   Conceptual View of Job Creation and Job Destruction

*Definition of terminology*
    Job Creation
    Total increase in employment in the group of firms that increased employees in Period $t$
    Job Destruction
    Total decrease in employment in the group of firms that decreased employees in Period $t$
    Job Reallocation
    Job Creation + Job Destruction
    Net Creation
    Job Creation – Job Destruction

*Definition of indices*
    Job Creation Rate, JCR
    Total increase in the number of employed individuals in the group of firms that increased
    employees in Period $t$, divided by the total number of individuals employed by all firms at the
    start of Period t (end of Period $t-1$)

$$JCR_1 = \frac{\sum_{+}(N_t - N_{t-1})}{\sum N_{t-1}}$$
($Nt$: number of employees at each firm at the end of Period $t$)

    Job Destruction Rate, JDR
    Total decrease in the number of employed individuals in the group of firms that decreased
    employees in Period $t$, divided by the total number of individuals employed by all firms at the
    start of Period $t$

$$JCR_1 = \frac{-\sum_{-}(N_t - N_{t-1})}{\sum N_{t-1}}$$

    Net Creation Rate, NCR
       $NCR = JCR - JDR$

    Job Reallocation Rate, JRR
       $JRR = JCR + JDR$

## 2. Data

This study covered all listed companies on the First and Second Sections of the Tokyo Stock Exchange, the Osaka Stock Exchange and the Nagoya Stock Exchange, and listed companies on all local stock exchanges, and all over-the-counter companies. The Fiscal 1998 sample number using micodata on an individual firm basis [2] was approximately 3,200 firms.

In previous research such as that of Genda (1997, 1998) and Higuchi and Shimpo (1998a), the data utilized was mainly business establishment data from the *Employment Trend Survey.* It is possible to also use business establishment data rather than data for firms to total job creation and job destruction. When the objective is not only to create this sort of numerical total but also to understand the principal causes of the employment increase, however, it is preferable to use the data from the firms that form management decision-making entities. Because we used data from marketable securities reports, for the analysis for this report we were able to include information on employee attributes such as average age or wages, and information on factors that influence decisions by firms to change employment, such as revenues or profit performance or corporate finances.

There are also some weaknesses, however, that arise from using a sample that is limited to only listed and publicly traded companies. This is the problem of so-called sample bias [3]. The *Employment Trend Survey* that was used by Genda (1997, 1998) and Higuchi and Shimpo (1998a) covers approximately 14,000 business establishments that were randomly selected from all private, public and national government offices that employ five or more full-time regular workers. On the other hand, in addition to being comparatively large in size, many of the listed and publicly traded firms that were the focus of the analysis for this report are characterized as top firms that have met the strict criteria for being listed and publicly traded as well as being top performers in terms of operating results and financial position [4]. Accordingly, careful attention must be taken when attempting to apply and interpret the results of the analysis presented in this paper to all Japanese firms.

Furthermore, in order to ensure an adequate sample number, we used individual firm accounting rather than consolidated accounting. When preparing the analysis we normalized the original data listed in each firms' marketable securities information report as follows.

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[2] Also contains some firms immediately before they were listed and publicly traded on a stock exchange. Also includes firms that were listed on the Hiroshima Stock Exchange and the Niigata Stock Exchange, which were merged into the Tokyo Stock Exchange in March 2000.

[3] In addition to sample bias, there is also a problem because the survey was limited to an analysis of on-going concerns and did not include an analysis of jobs created when new companies were established or jobs lost because of bankruptcies or businesses being abandoned. To analyze job creation at newly-established firms or the job destruction that accompanies actions such as business shutdowns or cessation of business lines, a separate analysis based on the *Establishment and Enterprise Census* and the *Establishment Directory Maintenance Survey* from the Management and Coordination Agency, such as that by Higuchi and Shimpo (1998a) or Genda (1999) is required.

[4] For specific details refer to Appendix Commentary 1.

> ***Data normalization method***
>
> 1. We defined each fiscal year to be from April through March of the following year; we made the firm's fiscal year-end numbers within this period the data for the fiscal year in question.
> 2. For firms with two or more settlement periods in a fiscal year, we used the accounting period with the most months. For the outstanding balance at that time we took the end-of-period value for the settlement used, and converted the flow value to 12 months.
> 3. When two listed companies merged, as a general rule, after the merger we totaled both firms using only the pre-merger data of the comparison firms [5].

Basically the company data used for the report is from the Development Bank of Japan's company finance databank. Because this database does not have data on the finance and insurance industries, however, for these industries we used data obtained from each company's marketable securities reports and the *Corporate Quarterly Handbook* published by Toyo Keizai, Inc. [6]

Before moving to the empirical analysis, an additional word of caution is warranted concerning the data concerning employees that form the nucleus of this paper's analysis. In addition to information on end-of-period employees, the Development Bank of Japan's company finance databank also contains data on "temporary, part-time and other employees otherwise not included in end-of-period employees". For this paper we regarded end-of-period employees as regular employees, and treated temporary, part-time and other employees otherwise not included in end-of-period employees as temporary employees. In the database before Fiscal 1976, however, the information on temporary, part-time and other employees otherwise not included in end-of-period employees was recorded in the end-of-period employee headcount, so a discontinuity occurs from that year. Accordingly, we set the period for the analysis for the years when the data is usable from Fiscal 1978 until Fiscal 1998 [7].

The empirical analysis regarding job creation and job destruction of regular employment is discussed in Chapter I. As a convenience, regular employee is referred to simply as "employee".

### 3. Job Creation and Job Destruction Trends

### 3.1. Overall Trend

Using the analytical method described above, we calculated the Job Creation Rate, the Job Destruction Rate, the Net Creation Rate and the Job Reallocation Rate. The results are shown in Table 1-2 [8].

Both the Job Creation Rate and the Job Destruction Rate hovered at approximately 2% during the 1980s. During the bubble era, however, the Job Creation Rate leapt upward, while the

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[5]  For mergers involving a sales subsidiary where a simple summation was believed to not be appropriate, however, we did not sum the numbers. In addition, we made no adjustments for mergers with firms that were not listed and publicly traded or for changes such as business spin-offs or separations into several firms.

[6]  For all data except for finance and insurance, for the years in which each firm was established we also supplemented the data using each firm's respective marketable securities report and the *Corporate Quarterly Handbook* published by Toyo Keizai, Inc.

[7]  Because the number of employees at the end of the prior fiscal year is required in order to calculate the Job Creation Rate and Job Destruction Rate, the period for the analysis was begun in Fiscal 1978.

[8]  As explained in Note 3, for listed and publicly traded firms it is difficult to analyze job creation by newly established firms or job destruction as a result of bankruptcies, shutdowns, etc. We did complete an analysis of job destruction resulting from bankruptcies, shutdowns, etc., however, based upon the premises outlined in Appendix Note 2.

Job Destruction Rate declined substantially. In both Fiscal 1990 and 1991 the Job Creation Rate reached 3.1%, respectively, while the Job Destruction Rate in both Fiscal 1990 and 1991 was 0.7%. This situation changed after Fiscal 1992, however, as the Job Creation Rate declined as the Job Destruction Rate rose, and both rates reversed their direction in Fiscal 1993. In Fiscal 1998, the Job Destruction Rate climbed to 3.3% and exceeded the Job Creation Rate by more than 1%.

Turning to the Net Creation Rate and the Job Reallocation Rate, in Fiscal 1990 the Net Creation Rate – the difference between the Job Creation Rate and the Job Destruction Rate – climbed to 2.5% as the result of the increase in the Job Creation rate and the decline in the Job Destruction Rate during the bubble years. In Fiscal 1993, however, following the burst of the bubble, the Job Destruction Rate exceeded the Job Creation rate and the Net Creation Rate turned negative. The rate remained negative for the next six years, through Fiscal 1998. On the other hand, the Job Reallocation Rate – the sum of the Job Creation Rate and the Job Destruction Rate – has gradually increased during the past 20-year period, and looked at from this indicator only there has been a gradual expansion of labor movement [9].

Next we turned our attention to the number of firms and looked at the percentage of firms that increased jobs (Job Creation Firms) and the percentage of firms that decreased jobs (Job Destruction Firms) as a share of all companies. When we compare these movements to the changes in the Job Creation Rate and the Job Destruction Rate, respectively, we can discern no obvious discrepancies and both percentages show consistent movement. Until Fiscal 1988 the percentage for the Job Creation Firms moved almost entirely with a range of 40 – 60%. In Fiscal 1989, however, the percentage rose above 60%, which until then had been an upper limit, and reached 69.7% in Fiscal 1991. Following the collapse of the bubble economy, however, this phenomenon reversed itself in Fiscal 1994 and dropped below the old lower limit of 40%, as the ranks of firms that reduced employment swelled. Job Creation Firms represented 32.5% of all companies in Fiscal 1998.

The above analysis confirmed the gross job creation and job destruction behind the net change in employment by using the actual data. Although the Net Creation Rate during the bubble years was between 2% to 3%, this did not mean that all firms were in fact increasing jobs together, for about one-quarter of all firms were reducing jobs and the Job Destruction Rate fell below 0.7%. In the mirror situation, although the Net Creation Rate was negative during the years from Fiscal 1993 onward, approximately 30% of all firms were increasing the number of jobs and the Job Creation Rate was also maintained at the 1% level. So we can see, from the microdata for individual firms before it is aggregated, many important facts which otherwise would be overlooked by using the aggregated data only [10].

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[9] Although the Job Reallocation rate is used as an indicator showing the size of labor force movement, the Job Reallocation Rae is the simple sum of the Job Creation Rate and the Job Destruction Rate and is not a proper indicator showing the size of job changes.

[10] When we compare the Job Creation Rate and Job Destruction Rate for listed and publicly traded firms calculated for this report with the results from Higuchi and Shimpo (1998a) which are shown in Table 1-1, both the Job Creation Rate and the Job Destruction Rate from the results in this report appear to be fairly small. Because the Job Creation Rate and Job Destruction Rate for Japan from Higuchi and Shimpo (1998a) was calculated from data for business establishments, we cannot make a simple comparison with the results of this study, which were calculated for firms. This points to the possibility of sample bias inherent in the data as one factor behind this discrepancy, because this report covered only listed and publicly traded firms. Moreover, because the data from Higuchi and Shimpo (1998a) were totaled at the business establishment level, they are thought to be effected by job transfers in and out of positions among business establishments of a single firm. In Genda (1998), the influence of job transfers in and out of positions among business establishments at the same firm are too large to be ignored.

**Table 1-2. Job Creation Rate, Job Destruction Rate, Net Creation Rate, Job Reallocation Rate and Percentage of Firms That Increased and Decreased Jobs**

(Unit: %)

| Fiscal Year | Job Creation Rate | Job Destruction Rate | Net Creation Rate | Job Reallocation Rate | Percentage of firms that increased jobs | Percentage of firms that decreased jobs |
|---|---|---|---|---|---|---|
| 1978 | 1.1 | 3.3 | -2.2 | 4.5 | 34.0 | 63.9 |
| 79 | 1.1 | 2.1 | -1.0 | 3.2 | 39.6 | 57.8 |
| 80 | 1.9 | 1.2 | 0.6 | 3.1 | 52.1 | 45.4 |
| 81 | 2.3 | 1.1 | 1.2 | 3.3 | 56.2 | 41.0 |
| 82 | 2.5 | 1.2 | 1.3 | 3.7 | 50.9 | 46.4 |
| 83 | 1.7 | 1.9 | -0.3 | 3.6 | 40.7 | 56.8 |
| 84 | 1.7 | 1.8 | -0.2 | 3.5 | 41.8 | 55.7 |
| 85 | 1.9 | 1.6 | 0.3 | 3.4 | 46.7 | 50.1 |
| 86 | 1.8 | 2.4 | -0.5 | 4.2 | 47.4 | 48.5 |
| 87 | 1.4 | 2.5 | -1.1 | 3.8 | 43.9 | 53.4 |
| 88 | 1.5 | 1.8 | -0.3 | 3.4 | 44.9 | 45.0 |
| 89 | 2.5 | 1.6 | 1.0 | 4.1 | 61.2 | 31.1 |
| 90 | 3.1 | 0.7 | 2.5 | 3.8 | 68.7 | 24.8 |
| 91 | 3.1 | 0.7 | 2.4 | 3.8 | 69.7 | 24.2 |
| 92 | 2.5 | 1.2 | 1.3 | 3.7 | 64.9 | 32.5 |
| 93 | 1.3 | 2.0 | -0.6 | 3.3 | 48.4 | 46.7 |
| 94 | 0.9 | 2.8 | -1.9 | 3.7 | 35.6 | 58.6 |
| 95 | 0.7 | 3.2 | -2.5 | 3.9 | 28.0 | 65.4 |
| 96 | 0.8 | 3.0 | -2.2 | 3.8 | 29.3 | 64.4 |
| 97 | 1.0 | 3.4 | -2.4 | 4.3 | 34.0 | 64.0 |
| 98 | 1.0 | 3.3 | -2.2 | 4.3 | 32.5 | 65.5 |

Note: Because some firms did not change the number of their employees the percentage of firms that increased employment and the percentage of firms that decreased employment do not always total 100% when added. This holds true for all of the following tables as well.

## 3.2. Trend by Industry

For the analysis that follows we divided the past 20-year period into four time periods covering Fiscal 1978-1983, Fiscal 1983-1988, Fiscal 1988-1993 and Fiscal 1993-1998 and calculated the Job Creation Rate and Job Destruction Rate (annual average, all following figures are the same) for each respective period.

Let us begin by classifying industries into 11 industrial sectors including four manufacturing classifications and seven non-manufacturing classifications. Table 1-3 shows the Job Creation Rate, Job Destruction Rate and Net Creation Rte according to this industrial sector scheme. While the Job Destruction Rate has a positive value based upon the original definition, for convenience sake we made them coded numbers and have shown the values as negative values.

The two periods for Fiscal 1978-1983 and Fiscal 1983-1988 share many points in common. Classifications that had high Job Creation Rates during these two time periods were the electric machinery industry and other machinery among the manufacturing industries, and sectors such as wholesale and retail, transportation and telecommunications, finance and insurance and services. These sectors pushed total employment upward. On the other hand, industries with a high Job Destruction Rate were materials-type manufacturing and other non-manufacturing industries that are represented by fishing and mining industries.

During the period for Fiscal 1988-1993, which included the bubble economy years, the Job Creation Rates in 10 of the 11 industrial sectors rose higher than during Fiscal 1983-1988, while the Job Destruction Rate shrank in eight sectors, and a rise in overall employment was seen. This was not only in the machinery industry or the wholesale and retail or services sectors that until

this time had lifted employment. Industries such as materials-type manufacturing industries or construction, which had been experiencing a net decline in employment, also saw a leap in the Job Creation Rate, which caused the Job Destruction Rate to decline sharply.

In the period covering Fiscal 1993-1998 following the collapse of the bubble economy the situation reversed and all 11 sectors saw the Job Creation Rate fall below the level of Fiscal 1988-1993, while the Job Destruction Rates expanded. As a result a net decrease in employment was seen in all sectors with the exception of services. One's attention is caught by the fact that even under these severe employment conditions the service sector and the wholesale and retail sector managed to maintain Job Creation Rates that exceeded 1.0%.

**Table 1-3.  Job Creation Rates and Job Description Rate by Industrial Sector**

### Fiscal 1978-1983
(Unit: %)

| | | Job Creation Rate | Job Destruction Rate | Net Creation Rate |
|---|---|---|---|---|
| Manufacturing | Materials | 0.6 | 1.9 | -1.3 |
| | Electric machinery | 2.6 | 0.3 | 2.3 |
| | Other machinery | 1.8 | 0.9 | 0.8 |
| | Other processing and assembly industries | 0.8 | 1.5 | -0.7 |
| Non-manufacturing | Construction | 1.3 | 0.4 | 0.9 |
| | Wholesale and retail | 1.4 | 1.1 | 0.3 |
| | Transportation and telecommunications | 1.1 | 1.6 | -0.5 |
| | Gas and electric power | 0.5 | 0.1 | 0.4 |
| | Finance and insurance | 2.0 | 0.5 | 1.5 |
| | Services | 1.7 | 0.1 | 1.6 |
| | Other non-manufacturing | 0.8 | 5.4 | -4.7 |

### Fiscal 1983-1988
(Unit: %)

| | | Job Creation Rate | Job Destruction Rate | Net Creation Rate |
|---|---|---|---|---|
| Manufacturing | Materials | 0.7 | 2.4 | -1.7 |
| | Electric machinery | 1.6 | 0.3 | 1.3 |
| | Other machinery | 1.4 | 2.2 | -0.8 |
| | Other processing and assembly industries | 1.3 | 1.3 | -0.0 |
| Non-manufacturing | Construction | 0.8 | 1.1 | -0.3 |
| | Wholesale and retail | 1.8 | 1.4 | 0.4 |
| | Transportation and telecommunications | 1.9 | 1.7 | 0.2 |
| | Gas and electric power | 0.3 | 0.4 | -0.0 |
| | Finance and insurance | 1.0 | 1.5 | -0.6 |
| | Services | 2.8 | 1.2 | 1.5 |
| | Other non-manufacturing | 1.2 | 3.1 | -1.9 |

### Fiscal 1988-1993
(Unit: %)

| | | Job Creation Rate | Job Destruction Rate | Net Creation Rate |
|---|---|---|---|---|
| Manufacturing | Materials | 1.5 | 1.4 | 0.1 |
| | Electric machinery | 2.2 | 0.5 | 1.7 |
| | Other machinery | 1.9 | 0.3 | 1.5 |
| | Other processing and assembly industries | 2.9 | 0.4 | 2.4 |
| Non-manufacturing | Construction | 3.3 | 0.0 | 3.3 |
| | Wholesale and retail | 2.9 | 0.5 | 2.4 |
| | Transportation and telecommunications | 1.4 | 2.3 | -0.9 |
| | Gas and electric power | 0.8 | 0.1 | 0.7 |
| | Finance and insurance | 1.5 | 0.3 | 1.2 |
| | Services | 3.8 | 0.3 | 3.5 |
| | Other non-manufacturing | 1.8 | 3.3 | -1.5 |

## Fiscal 1993-1998

(Unit: %)

| | | Job Creation Rate | Job Destruction Rate | Net Creation Rate |
|---|---|---|---|---|
| Manufacturing | Materials | 0.2 | 4.0 | -3.9 |
| | Electric machinery | 0.2 | 2.7 | -2.5 |
| | Other machinery | 0.3 | 2.3 | -2.0 |
| | Other processing and assembly industries | 0.5 | 2.5 | -2.0 |
| Non-manufacturing | Construction | 0.5 | 1.9 | -1.4 |
| | Wholesale and retail | 1.3 | 3.3 | -2.0 |
| | Transportation and telecommunications | 0.8 | 3.6 | -2.8 |
| | Gas and electric power | 0.3 | 0.3 | -0.1 |
| | Finance and insurance | 0.3 | 2.9 | -2.6 |
| | Services | 2.1 | 2.0 | 0.1 |
| | Other non-manufacturing | 1.6 | 3.9 | -2.3 |

Notes: 1. Although the sign for the Job Destruction Rate is negative ( – ), for convenience sake the figures in this report are shown as positive numbers.

2. Each firm is classified according to its principal business. "Materials-type industries" refers to paper and pulp, cement, ceramics and glass, textiles, chemicals, iron and steel and non-ferrous metals. "Other machinery" includes general machinery, transportation machinery, and precision machinery. "Other processing and assembly industries" are food and beverages, petroleum, metal products, rubber products, plastic products, wool products, etc. "Other non-manufacturing includes sectors such as mining, fishing and real estate.

3. Annual average value.

### 3.3. Trend by Size of Firm

Next we observed the trend by size of firm, based upon the number of employees, classified into five levels (1-299 employees, 300-499 employees, 500-999 employees, 1,000-4,999 employees, and 5,000 or more employees) using the number of employees at the end of the first fiscal year of each period. Table 1-4 shows the Job Creation Rate, Job Destruction Rate and other statistics in accordance with the above classification.

We can confirm the tendency for the Job Creation Rate to be high to the extent firm size is small. The Job Destruction Rate as well, which was high for comparatively small firms with 1-299 employees or 300-499 employees until the Fiscal 1983-1988 time period, rose relatively for large firms from Fiscal year 1988-1993, and the tendency for the rate to be high for small-scale firms gradually became less distinct. In the Fiscal 1993-1998 time period, the Job Destruction Rate of large-scale firms of 5,000 or more employees was the highest among the five categories, a trend that until now was impossible to verify [11].

### Table 1-4. Trend by Size of Firm (Classified into 5 Levels by Number of Employees)

|  | Fiscal year | 1-299 employees | 300-499 employees | 500-999 employees | 1000-4999 employees | 5000 or more employees |
|---|---|---|---|---|---|---|
| Job Creation Rate | 78-83 | 2.5 | 1.5 | 1.7 | 1.7 | 1.2 |
|  | 83.88 | 1.7 | 1.6 | 1.9 | 1.2 | 1.2 |
|  | 88-93 | 3.2 | 3.3 | 2.8 | 2.3 | 1.7 |
|  | 93-98 | 2.5 | 1.3 | 1.3 | 0.6 | 0.3 |
| Job Destruction Rate | 78-83 | 2.0 | 2.1 | 1.4 | 1.1 | 0.9 |
|  | 83-88 | 2.2 | 2.2 | 1.4 | 1.4 | 1.7 |
|  | 88-93 | 1.1 | 0.8 | 0.6 | 0.5 | 0.9 |
|  | 93-98 | 2.4 | 2.3 | 2.4 | 2.7 | 3.0 |
| Net Creation Rate | 78-83 | 0.5 | -0.6 | 0.3 | 0.5 | 0.3 |
|  | 83-88 | -0.6 | -0.6 | 0.5 | -0.2 | -0.5 |
|  | 88-93 | 2.1 | 2.5 | 2.3 | 1.8 | 0.7 |
|  | 93-98 | 0.1 | -1.0 | -1.2 | -2.2 | -2.7 |
| Percentage of firms that increases jobs | 78-83 | 42.8 | 33.6 | 46.6 | 52.3 | 48.5 |
|  | 83-88 | 45.2 | 45.1 | 48.8 | 44.9 | 44.9 |
|  | 88-93 | 63.2 | 65.7 | 73.4 | 72.9 | 77.1 |
|  | 93-98 | 36.8 | 33.0 | 31.3 | 20.7 | 12.6 |

Notes: 1. Classified into 5 levels by number of employees at end of the first fiscal year of each time period.

2. Annual average value for Job Creation Rate, Job Destruction Rate and Net Creation Rate.

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[11] Genda (1999) also carried out an analysis by number of employees using the business establishment data until 1995 in the *Employment Trend Survey.* The Job Creation Rate is consistent with the results of this report. But a result showing the Job Destruction Rate to be higher to the extent firms are small was derived, with this tendency growing weaker after the Fiscal 1983-1988 time period, which is at odds with the results of this paper. The fact that the sample size for small firms for this report is extremely small because the sample was restricted to listed and publicly traded firms is surmised to be the principal cause of this discrepancy. But the difference in the time frames of the respective studies should be noted as well. For this report we used data until Fiscal 1998, which confirmed that the rise in the Job Destruction Rate at large-scale firms until 1998 was remarkably large. This points to the possibility that this type of movement in the final year is weakening the tendency for the Job Destruction Rate to be high the smaller the firm, as seen in the past. Furthermore, it is also necessary to separately consider the effect of changes clearly visible at large-scale firms, such as transfers of employees to subsidiaries or affiliated companies or the spin-off of operating divisions.

## 3.4. Trend by Age of Company

We defined "company age" as the number of years that had passed since a company was established, and classified all firms into five levels (up to 19 years old, 20-29 years old, 30-39 years old, 40-49 years old, 50 years or older) depending upon the company age in the fiscal year at the start of each time period to observe the trends by company age [12]. Table 1-5 shows the Job Creation Rate, Job Destruction Rate and other statistics in accordance with the above classification.

For young firms that are 19 years old or younger, the Job Creation Rate showed a high level above 4% for all of the time periods. The reverse was true of companies where the company age was 50 years or greater, which showed the lowest Job Creation Rate among the five levels regardless of the time frame in question. The younger the company, the higher the Job Creation rate.

The relationship to Job Destruction Rate was not as clear as it was for the Job Creation Rate. But a tendency for the Job Destruction Rate to be lower at companies where the company age is younger can be seen [13]. Because the Job Destruction Rate of firms with a long company history declined substantially during the Fiscal 1988-1993 time period that included the bubble economy years, this tendency weakened temporarily. But because this changed completely in the Fiscal 1993-1998 time period and firms with a high company age saw their Job Destruction Rate rise much higher than that of other firms, however, the relative correlation of company age and Job Destruction Rate until Fiscal 1983-1988 was further clarified.

## Table 1-5. Trend by Company Age (Number of Years since Firm Established)

(Unit: %)

| | Fiscal year | 19 years or less | 20-29 years | 30-39 years | 40-49 years | 50 years or more |
|---|---|---|---|---|---|---|
| Job Creation Rate | 78-83 | 4.3 | 1.3 | 1.9 | 1.8 | 0.8 |
| | 83-88 | 4.9 | 2.1 | 1.5 | 1.3 | 0.8 |
| | 88-93 | 4.3 | 4.0 | 2.0 | 2.3 | 1.8 |
| | 93-98 | 4.3 | 2.0 | 1.0 | 0.3 | 0.3 |
| Job Destruction Rate | 78-83 | 0.5 | 1.1 | 1.0 | 1.0 | 1.2 |
| | 83-88 | 0.5 | 1.1 | 1.5 | 1.5 | 1.8 |
| | 88-93 | 0.4 | 0.4 | 0.9 | 0.5 | 0.5 |
| | 93-98 | 1.0 | 1.6 | 2.2 | 2.6 | 3.0 |
| Net Creation Rate | 78-83 | 3.8 | 0.2 | 0.9 | 0.8 | -0.4 |
| | 83-88 | 4.4 | 1.1 | -0.1 | -0.2 | -1.0 |
| | 88-93 | 3.9 | 3.6 | 1.1 | 1.8 | 1.4 |
| | 93-98 | 3.2 | 0.4 | -1.2 | -2.3 | -2.6 |
| Percentage of firms that increased jobs | 78-83 | 69.4 | 53.0 | 50.4 | 46.0 | 36.2 |
| | 83-88 | 70.0 | 65.6 | 50.9 | 41.8 | 36.2 |
| | 88-93 | 84.3 | 80.2 | 72.3 | 69.9 | 65.9 |
| | 93-98 | 66.2 | 50.4 | 42.4 | 23.9 | 13.5 |

Notes: 1. Classified into 5 levels by company age in the first fiscal year of each time period.
2. Annual average value for Job Creation Rate, Job Destruction Rate and Net Creation Rate.

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[12] While the dates when companies such as NTT, the various companies of JR and Japan Tobacco were established was the times at which these companies were privatized, we excluded these companies from this study because they had in fact been conducting business for many years.

[13] The perception is that business risk is higher and changes in employment are larger at firms that lack a long history. Because we looked only at firms that were on a growth track and whose shares were listed and public traded for this report, there is a possibility that the results reflect a sampling bias towards a low Job Destruction Rate.

### 3.5. Trend by Average Age of Employees

Next we looked at the trend by the attributes of the employees at each firm – that is, the trend by average age and average wage of employees. First we classified all firms into three levels depending on their average age of their employees (34 years old or younger, 35-39 years old, and 40 years old or older) in the first fiscal year of each time period. This provided the Job Creation Rate and Job Destruction Rate by the average age of employees. As can be seen from the results shown in Table 1-6, the tendency for the Job Creation Rate to be high and the Job Destruction Rate to be low the younger the average age of a firm's employees is clearly shown. During the time period of Fiscal 1988-1993, however, the Job Destruction Rate of firms with an average employee age of 40 years or older declined broadly, and the tendency for the Job Destruction Rate to be lower with a young average age of employees weakened temporarily. In the time period for fiscal 1993-1998, however, the Job Destruction Rate at firms where the average age of employees was 40 years older or older rose substantially and the correlation between average age of employees and Job Destruction Rate seen until the fiscal 1983-1988 time period became even clearer.

### Table 1-6. Trend by Average Age of Employees

(Unit: %)

|  | Fiscal year | 34 years or younger | 35-39 years old | 40 years or older |
|---|---|---|---|---|
| Job Creation Rate | 78-83 | 2.0 | 0.7 | 0.3 |
|  | 83-88 | 2.3 | 0.6 | 0.3 |
|  | 88-93 | 3.1 | 1.7 | 1.0 |
|  | 93-98 | 1.0 | 0.4 | 0.1 |
| Job Destruction Rate | 78-83 | 0.7 | 1.5 | 2.7 |
|  | 83-88 | 1.0 | 1.7 | 3.2 |
|  | 88-93 | 0.6 | 0.7 | 1.1 |
|  | 93-98 | 2.1 | 2.7 | 4.3 |
| Net Creation Rate | 78-83 | 1.4 | -0.8 | -2.4 |
|  | 83-88 | 1.3 | -1.1 | -2.9 |
|  | 88-93 | 2.5 | 1.0 | -0.0 |
|  | 93-98 | -1.2 | -2.3 | -4.2 |
| Percentage of firms that increased jobs | 78-83 | 62.8 | 32.9 | 16.9 |
|  | 83-88 | 61.0 | 44.3 | 21.4 |
|  | 88-93 | 77.9 | 74.5 | 54.3 |
|  | 93-98 | 43.2 | 20.1 | 12.2 |

Notes: 1. Classified into 3 levels by average age of employees in the first fiscal year of each time period.
      2. Annual average value for Job Creation Rate, Job Destruction Rate and Net Creation Rate.

### 3.6. Trend by Average Wage of Employees

We next examined the trend by the average wage of employees. For this report we defined the average wage of employees as the average monthly salary reported in the marketable securities reports of each firm. Next we classified all firms into three roughly even levels which we called, in order from the classification with the lowest average wage to the highest, as Classification I (Low), Classification II (Middle) and Classification III (High). We then calculated the Job Creation Rate and Job Destruction Rate according to the above classifications, determining the results that are shown in Table 1-7 [14].

The relationship between the average wage of employees and the Job Creation Rate and Job Destruction Rate is not as clear at the relationship for average age of employees. Despite the fact that the difference is small with regard to the Job Creation Rate, however, we can see a tendency for the Job Creation Rate to decline as the average wage increases from Classification I to Classification III. On the other hand almost no difference is found in the Job Destruction Rate for differences in average wage.

### Table 1-7.   Trend by Average Wages of Employees

(Unit: %)

| | Fiscal year | Classification I (Low) | Classification II (Middle) | Classification III (High) |
|---|---|---|---|---|
| Job Creation Rate | 78-83 | 2.3 | 1.3 | 1.1 |
| | 83-88 | 1.6 | 1.3 | 1.1 |
| | 88-93 | 2.8 | 2.2 | 1.7 |
| | 93-98 | 1.3 | 0.4 | 0.3 |
| Job Destruction Rate | 78-83 | 1.3 | 1.1 | 1.0 |
| | 83-88 | 1.8 | 1.5 | 1.6 |
| | 88-93 | 1.1 | 0.7 | 0.7 |
| | 93-98 | 3.0 | 2.7 | 2.9 |
| Net Creation Rate | 78-83 | 0.9 | 0.2 | 0.1 |
| | 83-88 | -0.1 | -0.2 | -0.5 |
| | 88-93 | 1.7 | 1.5 | 1.0 |
| | 93-98 | -1.7 | -2.2 | -2.6 |
| Percentage of firms that increased jobs | 78-83 | 51.2 | 46.1 | 41.3 |
| | 83-88 | 50.5 | 44.3 | 42.7 |
| | 88-93 | 66.9 | 72.3 | 72.7 |
| | 93-98 | 35.5 | 24.9 | 17.9 |

Notes:  1.   Classified into 3 levels by average wage of employees in the first fiscal year of each time period.

2.   Annual average value for Job Creation Rate, Job Destruction Rate and Net Creation Rate.

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[14] For the average wages reported here we used the average monthly wages as reported in marketable securities reports. As a general rule, the average monthly wages as defined for the reports is the average monthly wage per month including the final month of the fiscal year in question, excluding bonuses. In addition to this data, information regarding average wages can be obtained by a method of dividing the portion equivalent to personnel expenses such as wages or salaries in the Income Statement by the number of employees at the end of the fiscal year. We also completed an analysis using the latter method, which produced nearly identical results.

## 3.7. Trend by Revenues

Next we classified all firms into three levels according to the rate of revenue growth. For each respective time period we calculated the rate of revenue growth from the beginning of the time period until the end of the time period, and separated the firms into a group of firms where the revenue increased and a group of firms where the revenue decreased. We then classified all of the firms into 3 levels we labeled Increasing Revenue (Upper), Increasing Revenue (Lower) and Decreasing Revenue, by dividing in the group of firms that increased revenues evenly into two classifications (Upper, Lower) in order from the highest growth rate.

It is possible to confirm from the results shown in Table 1-8 that the higher the rate of revenue growth, the higher the Job Creation Rate and the lower the Job Destruction Rate. This is the natural expected outcome, however, and what we are interested in here is how distinctly is the tendency demonstrated when compared with other classifications. When we look at the results again from this perspective, the correlation of revenue to the Job Creation Rate and Job Destruction Rate is much more evident than for other classifications. This leads us to believe that sales are a principal factor greatly influencing firms' decision-making with regard to increases and decreases in employment levels.

## Table 1-8. Trend by Rate of Revenue Growth

(Unit: %)

| | Fiscal year | Increasing Revenue (Upper) | Increasing Revenue (Lower) | Decreasing Revenue |
|---|---|---|---|---|
| Job Creation Rate | 78-83 | 2.1 | 0.4 | 0.1 |
| | 83-88 | 2.4 | 0.8 | 0.2 |
| | 88-93 | 3.6 | 1.5 | 1.0 |
| | 93-98 | 2.0 | 0.2 | 0.1 |
| Job Destruction Rate | 78-83 | 0.5 | 1.8 | 5.0 |
| | 83-88 | 0.4 | 1.5 | 4.4 |
| | 88-93 | 0.1 | 0.9 | 1.8 |
| | 93-98 | 1.3 | 2.6 | 3.7 |
| Net Creation Rate | 78-83 | 1.5 | -1.4 | -4.9 |
| | 83-88 | 2.0 | -0.7 | -4.2 |
| | 88-93 | 3.5 | 0.6 | -0.8 |
| | 93-98 | 0.6 | -2.4 | -3.6 |
| Percentage of firms that increased jobs | 78-83 | 67.9 | 28.6 | 8.2 |
| | 83-88 | 70.5 | 37.0 | 16.2 |
| | 88-93 | 88.1 | 72.1 | 46.0 |
| | 93-98 | 60.2 | 32.9 | 12.8 |

Notes:  1.   Classified into 3 levels by rate of revenue growth from the beginning to the end of each time period.
2.   Annual average value for Job Creation Rate, Job Destruction Rate and Net Creation Rate.

As the above shows, in addition to the important factor of expansion of business size as seen in an increase in revenue, other factors that influence the job creation of firms are a relatively small size, young company age, low average age of employees and low average wage of employees. During the bubble era, however, we can see that overall the Job Creation Rate rose and the Job Destruction Rate fell regardless of whether a firm was large or small, the age of company was high or low, and average age and average wages of employees was high or low. These tendencies so unique to the bubble era are particularly evident at long-established firms or firms where the average age of employees was high, and after the bubble collapsed the shift of these firms to a situation of stagnant labor demand is quite remarkable.

## 4. Employment Change Decision Model

In Section 3 we observed the characteristics of firms that increased or decreased employment by classifying all firms into several levels using measures such as firm size, average employee wage level and rate of revenue growth, and comparing the Job Creation rate and Job Destruction Rates calculated for each respective classification. Re-totaling the microdata makes this analysis possible. But because we use a re-totaling method, in some sense we cannot say we are using the wealth of information already contained in the company-level data to the maximum extent possible. Therefore in this section we will add some observations about the leading factors that influence employment increases or decreases at firms by using microdata to approximate a simple employment change decision model [15]. The data we will use is the same data for individual listed and publicly traded firms that we used in the preceding sections (excluding finance and insurance, however).

We will assume the employment change decision model shown in Equation (1) to conduct a cross-section analysis for the time periods Fiscal 1978-1983, Fiscal 1983-1988, Fiscal 1988-1993 and Fiscal 1993-1998, respectively.

$$Y_j = prob\ (C_j,\ I_k) \hspace{3cm} \text{Equation (1)}$$

This model is a *Probit* model to explain each firm's choice ($Y_j$) to increase employment (1) or not increase employment (0) using firm characteristics ($C_j$) and industry characteristics ($I_k$). The specific independent variables are shown in Table 1-9. For industry characteristics ($I_k$) we selected the percentage increase or decrease in employment in Industry $k$ to which Firm $j$ belongs as the independent variable. That is, by deciding to make the industry characteristics fulfill the role of the industry dummy variable, we can observe those firm characteristics that influence the change in employment by eliminating employment at Firm $j$ as a factor that affects changes in Industry $k$ to which that firm belongs.

## Table 1-9. Independent Variables (1)

| | | Independent variable | Assumed sign |
|---|---|---|---|
| Firm characteristics | Business expansion factor | Percentage change in revenues (Defrated using the GDP deflator for each industry) | + |
| | Firm financial factor | Increase in debt ratio (defined here as liabilities/total assets) | – |
| | Firm size factor | Number of employees at year-end (first year of time period) | + or – |
| | Employee aging factor | Average age of employees (first year of time period) | + or – |
| | Labor quality factor | Average wage of employees (first year of time period) | + or – |
| | Company age factor | Company age (first year of time period) | + or – |
| Industry characteristics | | Percentage change in number of employees in the relevant firm's industry | + |

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[15] There are several examples of prior research using firm and business establishment data to estimate an employment decision-making model. An analysis of principal causes of changes in employment in manufacturing was conducted by Tachibanaki and Morikawa (1998) using the business establishment data in tables in the *Census of Manufactures*. Abe (1999) analyzed the influence that corporate governance has on employment by adding stock ownership percentage to the independent variables for the four industrial sectors of chemicals, iron and steel, electric machinery and wholesale and retail.

We adopted the following independent variables for firm characteristics ($C_j$). As the business expansion factor we used the rate of increase in revenue (deflated by the GDP deflator for each industry). The coefficient sign was assumed to normally be positive. As the firm financial factor we used the range of increase in the debt ratio[16], which we assumed would have a negative sign. For the above two independent variables we decided to use a one-tail test as the test method.

For the following four independent variables we used a two-tail test, because a clear theoretical background for assuming the sign of the coefficient cannot be determined and the sign could be positive or negative. As the firm size factor we adopted the number of employees at the end of the time period as the independent variable. As we saw in Section 3, the smaller the number of employees the higher the Job Creation Rate, but simultaneously with this the tendency was also seen until Fiscal 1983-1988 for the Job Destruction Rate to also be higher the smaller the size of firm. So accurately assuming the direction of the sign is difficult. The average age of employees is a representative variable for the employee age factor. We'll look at how a change in the make-up of employee age effects a firm's personnel expense burden.

We used average wages of employees for the indicator to show labor quality. We reasoned that if wages are assumed to be consistent with marginal productivity of labor and correctly reflect labor quality skills or ability, the sign will be positive if the industry characteristics can be completely eliminated because a firm's labor quality is believed to be high when its wages are high and the firm is superior to other firms in the same industry. If wages are not consistent with the marginal productivity of labor, however, this will not be the case. We assume that when there is wage inflexibility ("stickiness") in a downward direction and wages are relatively high in relation to the marginal productivity of labor, the labor cost side including wages will be emphasized and the sign will be negative.

Finally, we added company age factor as an independent variable [17]. To the extent we saw in the results of Section 3 a high company age has a negative influence on employment, but although the sign is assumed from experience to be negative the theoretical basis for this is not clear. To venture a theory, we think that as a company ages its decision-making becomes more rigid, the firm loses dynamism, and it becomes indecisive about expansion in new business sectors and slow to respond to changes in its business, all of which can have a negative effect on employment. But because of the fact there are established firms thought to have survived a long time precisely because they possess traits superior to other companies, the possibility that the sign is positive cannot be eliminated.

In addition to the Probit model estimation composed of the above independent variables, we also made an estimate using the ordinary least squares method (OLS). For the estimation by OLS we defined the dependent variable to be the percentage increase or decrease in the number of employees of each firm, and used the exact same variables as the Probit model for the independent variables. Furthermore, in order to avoid the scattering unevenness sometimes found in cross-section analysis, we applied White's correction [18] when performing the t tests. The results of the above estimation are shown in Table 1-10.

First, except for the Fiscal 1983-1988 OLS the industry characteristics all showed significant positive values, making it possible to verify that factors such as the overall demand trend for the

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[16] Although the debt ratio normally refers to debt/equity, for this report we defined the debt ratio to be debt/total assets.

[17] For NTT, the various JR companies and Japan Tobacco, we calculated the company ages from the dates when Nippon Telegraph and Telephone Corporation (1952), Japan National Railway (1949) and Japan Monopoly Corporation (1949), the predecessor companies, were established.

[18] Because of the possibility for scattering unevenness to remain in the results from the Breusch-Pagan Test or White Test, we performed White's correction. The consistent standard errors from White's correction are called HCSEs (Heteroskedasticity-Consistent Standard Errors).

industry to which a firm belongs has an effect on employment. Looking at firm characteristics, the percentage increase or decrease in revenues showed significant positive values with the Probit and OLS methods through all time periods, showing that the firm growth factor is an important cause of employment increases. Although the size of the increase in the debt ratio also showed a negative value through all time periods, the only significant result before Fiscal 1983-1988 was with the Probit model for Fiscal 1978-1983. All of the characteristics show significant negative values from Fiscal 1988-1993 onward, and we can infer that the firm financial factor increased in importance. The number of employees at the end of the first year in each time period generally shows a significant negative value and the firm size factor is also believed to have a negative effect on changes in employment. The average age of employees has significant negative values, and we conjecture that firms where the burden for personnel expense is growing because of the increase in average employee age are firms that are cutting employment. The average wage of employees shows significant positive values until Fiscal 1988-1993 and firms with high labor quality were increasing employment. This became less clear in Fiscal 1993-1998, however, when we believe the cost side including wages was emphasized more. We believe that as the average age of employees increased the percentage of workers positioned near the peak of the wage profile has increased, which also effects average wages, and it's possible this made the cost side including wages more obvious. Except for Probit for Fiscal 1988-1993 the company age factor shows significant negative values, and we surmise that firms where the ability to grow has declined as they grew older are reducing employment.

## Table 1-10.  Estimation Results (1)

| | Fiscal 1978-1983 | | Fiscal 1983-1988 | | Fiscal 1988-1993 | | Fiscal 1993-1998 | |
|---|---|---|---|---|---|---|---|---|
| | PROBIT | OLS | PROBIT | OLS | PROBIT | OLS | PROBIT | OLS |
| Constant term | 2.89** | 39.70** | 2.64** | 41.99** | 1.54** | 41.79** | 2.10** | 21.49** |
| | 7.79 | 6.15 | 7.36 | 7.14 | 5.16 | 7.50 | 7.30 | 4.29 |
| Percent change in revenues (Deflated using GDP deflator for each industry) | $7.67\times10^{-3}$** | 0.12** | 0.01** | 0.19** | 0.01** | 0.25** | 0.01** | 0.32** |
| | 9.99 | 7.72 | 12.55 | 11.11 | 11.12 | 11.22 | 13.53 | 7.34 |
| Increase in debt ratio | -0.01** | -0.06 | $-3.76\times10^{-3}$ | -0.01 | -0.01** | -0.06** | -0.02** | -0.18** |
| | -3.32 | -0.46 | -1.21 | -0.23 | -4.92 | -1.40 | -5.56 | -2.03 |
| Number of employees at year-end (first year of time period) | $-6.99\times10^{-6}$ | $-1.69\times10^{-4}$** | $-1.17\times10^{-5}$** | $-2.08\times10^{-4}$** | $-2.44\times10^{-6}$ | $-1.73\times10^{-4}$ | $-2.82\times10^{-5}$** | $-1.81\times10^{-4}$** |
| | -1.05 | -3.07 | -1.69 | -2.89 | -0.54 | -1.52 | -3.28 | -2.36 |
| Average age of employees (first year of time period) | -0.11** | -1.51** | -0.10** | -1.50** | -0.08** | -1.47** | -0.06** | -0.58** |
| | -9.20 | -7.93 | -9.09 | -8.12 | -8.68 | -9.72 | -5.90 | -3.31 |
| Average wage of employees (first year of time period) | $3.06\times10^{-3}$** | 0.07** | $3.39\times10^{-3}$** | 0.06** | $4.91\times10^{-3}$** | 0.06** | $-4.07\times10^{-5}$ | 0.11 |
| | 2.48 | 2.82 | 3.63 | 2.72 | 7.05 | 5.10 | -0.07 | 1.18 |
| Company age (first year of time period) | $-7.69\times10^{-3}$** | -0.13** | $-6.27\times10^{-3}$** | -0.15** | $1.52\times10^{-3}$ | -0.07** | -0.01** | -0.15** |
| | -3.13 | -4.11 | -4.57 | -4.57 | 0.72 | -2.28 | -4.69 | -4.68 |
| Industry characteristics | 0.02** | 0.32** | 0.02** | 0.08 | 0.02** | 0.41** | 0.04** | 0.68** |
| | 4.47 | 2.77 | 3.60 | 1.11 | 6.00 | 6.21 | 6.84 | 5.24 |
| Sample size | 1.543 | | 1.638 | | 2,008 | | 2,396 | |
| Number of positive cases | 685 | | 762 | | 1,407 | | 648 | |
| Logarithmic likelihood | -866.1 | | -904.5 | | -1,032.0 | | -1,104.9 | |
| Adj. R² | | 0.22 | | 0.28 | | 0.30 | | 0.19 |
| F value | | 62.3 | | 90.0 | | 124.6 | | 83.0 |

Notes: 1. The dependent variables are as follows. For Probit the firms that increased employment are positive. For OLS, figures are the percentage change in the number of employees at each firm.
2. The lower set of values in each row is the t Value; "*" indicates significant to the 10% level, "**" indicates significant to the 5% level.
3. Excluding finance and insurance.

Next let us analyze the 1990s in a little more detail, using newly added independent variables. The independent variables are shown in Table 1-11. First we've added the size of the increase in operating profit margin since the prior time period and a dummy variable for two consecutive periods of operating losses (prior period, period before the prior period) as an operating performance factor. We assume the sign for the size of increase in operating profit margin to be positive and the sign for the dummy for two consecutive periods of operating losses to be negative. Muramatsu (1986) or Abe (1999) found results showing that two consecutive periods of operating losses effect decision-making to reduce employment for certain groups of firms or industry classifications, but we'll look to see whether this result occurs for all of the industry classifications (finance and insurance excluded). Furthermore, in light of the fact that firm managers have recently been focusing on market evaluations such as stock price or debt ratings, we adopted the percentage increase in stock price from the prior time period as a market factor. We assume this has a positive sign. We carried out our esitmations for four time periods covering Fiscal 1991-1992, Fiscal 1993-1994, Fiscal 1995-1996 and Fiscal 1997-1998; the results are shown in Table 1-12.

## Table 1-11.   Independent Variables (2)

| | | Independent variable | Assumed sign |
|---|---|---|---|
| Firm characteristics | Business expansion factor | Percentage change in revenues (prior time period) | + |
| | Operating performance factors | Size of increase in operating profit margin (prior time period) | + |
| | | Dummy variable for two consecutive periods of operating losses (losses in the prior period and period before the prior period) | − |
| | Firm financial factor | Increase in debt ratio (defined here as liabilities/total assets) (Prior period) | − |
| | Market factor | Percentage increase in stock price (percentage increase in average of highest and lowest stock prices during time period and prior period) | + |
| | Firm size factor | Number of employees at year-end (first year of time period) | + or − |
| | Employee aging factor | Average age of employees (first year of time period) | + or − |
| | Labor quality factor | Average wage of employees (first year of time period) | + or − |
| | Company age factor | Company age (first year of time period) | + or − |
| Industry characteristics | | Percentage change in number of employees in the relevant firm's industry | + |

## Table 1-12.  Estimation Results (2)

| | Fiscal 1991-1992 | | Fiscal 1993-1994 | | Fiscal 1995-1996 | | Fiscal 1997-1998 | |
|---|---|---|---|---|---|---|---|---|
| | PROBIT | OLS | PROBIT | OLS | PROBIT | OLS | PROBIT | OLS |
| Constant term | 1.05** | 8.60** | 0.30 | 1.41 | 2.54** | 10.69** | 3.22** | 13.34** |
| | 4.02 | 4.60 | 1.64 | 0.73 | 9.21 | 6.22 | 12.18 | 7.14 |
| Percent change in revenues | 0.02** | 0.12** | 0.03** | 0.13** | 0.01** | 0.09** | 0.02** | 0.11* |
| (prior time period) | 6.65 | 3.35 | 10.44 | 3.98 | 6.09 | 3.21 | 8.36 | 3.82 |
| Size of increase in operating profit margin | 0.01* | 0.15** | $1.83 \times 10^{-3}$ | 0.10 | $7.64 \times 10^{-3}$ | 0.08 | 0.02** | 0.23** |
| (prior time period) | 1.31 | 1.76 | 0.22 | 0.95 | 0.92 | 1.02 | 2.53 | 2.54 |
| Dummy variable for two consecutive periods of operating losses (losses in prior period and period before the prior period) | -0.56** | -3.96** | -0.67** | -5.29** | -0.71** | -5.59* | -0.41** | -7.61** |
| | -2.96 | -2.80 | -5.94 | -6.69 | -5.17 | -6.39 | -2.61 | -6.82 |
| Increase in debt ratio | $-6.60 \times 10^{-3}$ | -0.10** | $9.24 \times 10^{-3}$ | 0.16 | $-8.38 \times 10^{-3*}$ | $-2.16 \times 10^{-4}$ | $-8.25 \times 10^{-3*}$ | -0.10** |
| (prior time period) | -1.13 | -1.82 | 1.69 | 0.98 | -1.39 | $-4.24 \times 10^{-3}$ | -1.48 | -2.17 |
| Percentage increase in stock price | $6.28 \times 10^{-3**}$ | 0.02** | $1.98 \times 10^{-3**}$ | 0.03** | $1.39 \times 10^{-3}$ | $-4.77 \times 10^{-3}$ | $9.16 \times 10^{-3**}$ | 0.04** |
| (prior time period) | 3.83 | 1.68 | 1.88 | 3.16 | 1.07 | -0.52 | 6.44 | 4.51 |
| Number of employees at year-end | $1.48 \times 10^{-6}$ | $-2.44 \times 10^{-5**}$ | $-2.06 \times 10^{-5**}$ | $-2.92 \times 10^{-5}$ | $-1.39 \times 10^{-5**}$ | $-1.35 \times 10^{-5}$ | $-1.73 \times 10^{-5**}$ | $-2.56 \times 10^{-5**}$ |
| (first year of time period) | 0.40 | -2.28 | -2.81 | -2.46 | -2.07 | -1.09 | -2.46 | -2.12 |
| Average age of employees (first year of time period) | -0.06** | -0.25** | $-3.81 \times 10^{-4}$ | 0.03 | -0.06** | -0.27** | -0.08** | -0.32** |
| | -7.28 | -4.69 | -0.14 | 0.50 | -7.04 | -5.66 | -9.32 | -5.53 |
| Average wage of employees (first year of time period) | $4.35 \times 10^{-3**}$ | $5.81 \times 10^{-3}$ | $6.12 \times 10^{-4}$ | $-1.57 \times 10^{-3}$ | $-4.42 \times 10^{-4}$ | $1.75 \times 10^{-3}$ | $1.85 \times 10^{-4}$ | $2.77 \times 10^{-3}$ |
| | 7.35 | 1.33 | 1.25 | -0.45 | -0.86 | 0.73 | 0.40 | 0.80 |
| Company age (first year of time period) | $2.22 \times 10^{-3}$ | $2.19 \times 10^{-3}$ | -0.01** | -0.04** | -0.01** | -0.05** | -0.01** | -0.04** |
| | 1.19 | 0.22 | -5.90 | 0.299 | -5.25 | -4.80 | -5.52 | -3.58 |
| Industry characteristics | 0.06** | 0.39** | 0.11** | 0.48** | 0.07** | 0.35** | 0.06** | 0.05** |
| | 3.52 | 2.49 | 6.87 | 4.23 | 3.89 | 4.16 | 4.33 | 4.57 |
| Sample size | 2,217 | | 2,348 | | 2,553 | | 2,847 | |
| Number of positive cases | 1,443 | | 847 | | 763 | | 897 | |
| Logarithmic likelihood | -1,308.2 | | -1,344.5 | | -1,365.2 | | -1,456.6 | |
| Adj. R2 | | 0.06 | | 0.11 | | 0.15 | | 0.17 |
| F value | | 15.7 | | 28.9 | | 44.9 | | 59.6 |

Notes: 1.  The dependent variables are as follows. For Probit the firms that increased employment are positive. For OLS, figures are the percentage change in the number of employees at each firm.
   2.  The lower set of values in each row is the t Value; "*" indicates significant to the 10% level, "**" indicates significant to the 5% level.
   3.  Excluding finance and insurance.

The industry characteristics are shown as significant positive values in the same manner as the estimation results shown in Table 1-10. Looking at firm characteristics, the increase in revenues shows significant positive values, indicating the firm growth factor to an important cause of increases in employment. The size of the increase in operating profit margin has significant positive values for Fiscal 1991-1993 and Fiscal 1997-1998, suggesting that the operating result factor also influences change in employment. The dummy variable for two consecutive periods of operating losses shows significant negative values, so the results determined that for cases covering all industrial sectors as well (excluding finance and insurance), two consecutive periods of operating losses do influence cutbacks in employees. The size of the increase in the debt ratio also shows significant negative values for Fiscal 1995-1996 and thereafter for the Probit model, and for Fiscal 1991-1992 and Fiscal 1997-1998 for OLS, so we

can see that financial health too influences changes in employment. In addition, the percentage increase in stock price shows significant positive values for all periods except for Fiscal 1995-1996. Stock price is an indicator that comprehensively reflects expected future profits or assets values, and gives us a look at circumstances where changes in the market valuation of a firm and changes in employment move together almost consistently [19]. The number of employees at the end of the first year in each time period is not always significant but does show negative values; the effect of the firm size factor is also undeniable. The average age of employees shows significant negative values except for Fiscal 1993-1994, and we conjecture that firms where the burden for personnel expense is growing because of the rise in average employee age are firms that are cutting employment. Almost no significant values were obtained for the average wage of employees, and the influence that high labor quality has on employment is unclear. Except for Fiscal 1991-1992 the company age factor shows significant negative values, a result that shows the increase in company age has a negative effect on employment.

When the results of the above analysis are taken together, the factors that can be observed to effect job creation at firms, in addition to firm growth or operating results such as firm profits, include comparatively small size, young company age, and low average age of employees. We can also see that during the 1990s the importance of the financial health of a firm increased and was added to the other important factors.

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[19] As indicated in the report, a firm's stock price is formed from and reflects fundamentals such as expected future profits or assets values. When the market valuation does not correctly reflect and is divorced from the fundamentals, however, the difference from the stock price the market was expected to originally form may exert an unforeseen shock to a firm.

## II    Observations Regarding Factors Behind the Spread of Temporary Employment

### 1.    Motivation and Data

The increase in the number of irregular workers without full-time contracts can be pointed to as the single largest change in Japan's labor market since the 1980s. Principal factors on the labor supply side that have long been regarded as important causes for the remarkable increase in irregular employees include the increase in the number of married women participating in the labor force or the need for part-time or second jobs by younger workers. In the latter half of the 1990s, however, firms have strengthened their preference for irregular labor rather than regular labor, and factors on the labor demand side causing changes in the appropriate proportion of regular and irregular workers being considered by firms have begun to grow in importance. Put another way, this is an indication that for firms the trend to rely on part-time or temporary workers – with their lower cost and higher flexibility – instead of using regular, full-time employees is growing stronger [20]. The purpose of this chapter is to use enterprise data to investigate whether there is indeed a movement to substitute regular employment with temporary employment.

As in Chapter I, we will study listed and publicly traded firms by making an analysis using the data from individual firms (excluding the finance and insurance sector, however). It is not possible to precisely understand the number of irregular workers because of limitations in the data. But when the number of temporary employees exceed a certain number and is listed in marketable securities reports [21], we will conduct our analysis of irregular workers by treating these numbers as temporary employment.

The data used in this chapter is also based on the Development Bank of Japan's company finance databank that was used for the analysis discussed in Chapter I. As explained previously, we have treated the data in the category "Number of Employees at Year-end" as regular employees, and treated the data for "temporary, part-time and other employees otherwise not included in end-of-period employees" as temporary employees. We removed firms that had no data in "temporary, part-time and other employees otherwise not included in end-of-period employees" from the sample, however. As a result we were able to use approximately 1,700 firms for the sample for Fiscal 1998. Also as previously explained we have normalized the data. The time periods used for the analysis are the same as those in Chapter I; the years after Fiscal 1978 when the data was restricted [22].

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[20] In their analysis, Osawa and Hausman (1999) reached the conclusion that the principal cause of the increase in part-time employment in Japan is the increase in demand for part-time workers on the labor demand side, and that the increase in participation in the labor market by married women, a labor supply side factor, can account for no more than about 20% of the total explanation.

[21] There is no precise definition for the "temporary employees" that are listed in marketable securities reports. Although a firm may recognize a worker as a temporary employee, the number of individuals listed is the number of employees who have their number of work hours stipulated in an employment contract. Care must therefore be exercised because this is not necessarily consistent with the classification in the *Labor Force Survey* from the Management and Coordination Agency. The firms that must publicly report the number of temporary employees in their marketable securities reports are firms that rely on temporary employees for 10% or more of their workforce. Firms to which this applies must list the average number of employees during the course of a year. Firms may omit this information when such workers are less than 10% of their total workforce, so it is not possible to obtain the number of temporary workers for all listed and publicly traded firms. Because the data for firms that do not reach 10% is dropped, a note must be made of this sample bias.

[22] As explained in Chapter I, both "number of employees at year-end" and "temporary, part-time and other employees otherwise not included in end-of-period employees" are listed in the Development Bank of Japan's company finance databank beginning from Fiscal 1977.

## 2. Creation and Destruction of Temporary Employment

We began by applying the Job Creation Rate and Job Destruction Rate used for the analysis in Chapter I to temporary jobs. We've called the figure obtained by dividing the total of the increased part of temporary employment at firms that increased temporary employment during Period *t* by total temporary employment for all firms at the beginning of Period *t* the Temporary Job Creation Rate, and we'll call the figure derived by dividing the total of the decreased part of temporary employment at firms that decreased temporary employment during Period *t* by the total temporary employment for all firms at the beginning of Period *t* the Temporary Job Destruction Rate. We divided the past 20-year period into four time periods covering Fiscal 1978-1983, Fiscal 1983-1988, Fiscal 1988-1993 and Fiscal 1993-1998, and calculated the Job Creation Rate and Job Destruction Rate (annual averages) for temporary employment and full-time employment, respectively. The results are shown in Table 2-1. [23]

### Table 2-1. Temporary Job Creation Rate and Destruction Rate

(Unit: %)

| | Fiscal year | Full-time employment | Temporary employment | Total |
|---|---|---|---|---|
| Job Creation Rate | 78-83 | 1.6 | 5.5 | 1.9 |
| | 83-88 | 1.4 | 5.0 | 1.8 |
| | 88-93 | 2.4 | 3.9 | 2.5 |
| | 93-98 | 0.8 | 5.8 | 1.8 |
| Job Destruction Rate | 78-83 | 1.2 | 1.5 | 1.0 |
| | 83-88 | 1.4 | 2.4 | 1.3 |
| | 88-93 | 0.5 | 1.8 | 0.5 |
| | 3.0 | 2.5 | 1.4 | 1.9 |
| Net Creation Rate | 78-83 | 0.4 | 4.0 | 0.9 |
| | 83-88 | -0.0 | 2.6 | 0.5 |
| | 88-93 | 1.9 | 2.1 | 2.0 |
| | 93-98 | -1.8 | 4.4 | -0.1 |
| Percentage of firms that increased jobs | 78-83 | 47.5 | 49.5 | 50.5 |
| | 83-88 | 50.8 | 54.6 | 55.7 |
| | 88-93 | 71.7 | 47.1 | 69.1 |
| | 93-98 | 33.8 | 49.6 | 37.8 |

Notes: 1. The Job Creation Rate, Job Destruction Rate and Net Creation Rate are annual average values.

2. Excluding finance and insurance.

The Temporary Job Creation Rate is consistently higher than the creation rate for full-time jobs. During Fiscal 1978-1983, Fiscal 1983-1988 and Fiscal 1993-1998 the Temporary Job Creation Rate was 5.5%, 5.0% and 5.8, respectively, levels that are in no way comparable to the full-time employment Job Creation Rate that was less than 2% during these time periods. In the time period covering Fiscal 1988-1993 that included the bubble economy period, however, the demand for full-time jobs increased and the full-time Job Creation Rate rose to 2.4%. At the same time the Temporary Job Creation Rate declined to 3.9%, nearly closing the gap between the two rates. The kind of movement seen during the bubble era is believed to be not only the result of intensified awareness of the shortage of workers, but also reflected the concerns that companies had about ensuring an adequate labor force for the future. Ultimately the increase in

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[23] The Creation Rate for full-time employment shown above was calculated for firms that listed data for temporary employment, because it was calculated for the purpose of comparison to the Temporary Job Creation Rate. Accordingly, the figures are not consistent with sample size shown and discussed in Chapter I and the results also differ slightly.

demand for full-time workers ran its course after a few years and during Fiscal 1993-1998, the Job Creation Rate for full-time jobs plunged below 1%. The Temporary Job Creation Rate for the same time period meanwhile reversed and climbed to more than 5%, once again widening the gap between the two rates.

Until Fiscal 1988-1993 the Job Destruction Rate was higher for temporary employment than for full-time employment. During Fiscal 1993-1998, however, following the collapse of the bubble economy, the Job Destruction Rate for full-time employment rose rapidly to 2.5%, while the Temporary Job Destruction Rate moved in the opposite direction and fell to 1.5%. So the Job Destruction Rate for full-time employment exceeded the Job Destruction Rate for temporary work.

Next let us turn our attention to the number of firms that increased temporary employment or full-time employment and examine the shares they represent respectively of all firms. The percentage of firms that increased temporary employment (Temporary Job Creation Firms) was stable throughout the past 20-year period at about 50%; the slight decline observed above in the Temporary Job Creation Rate in Fiscal 1988-1993 was an anomaly. On the other hand, the percentage of firms that increased full-time employment (Full-time Job Creation Firms) was around the 50% level in Fiscal 1978-1983 and Fiscal 1983-1988, similar to the level for temporary employment. When we turn to the period for Fiscal 1988-1993 that includes the bubble years, however, in contrast to the stable percentage for temporary employment that hovered around 50% the figure for full-time employment climbed above 70%. During Fiscal 1993-1998, after the collapse of the bubble economy, the percentage for Full-time Job Creation Firms reversed and declined to nearly 30% of all firms in the survey, a movement that contrasts sharply to that for temporary employment, which remained stable at approximately 50%.

When we turn to the Temporary Job Net Creation Rate by industrial sector shown in Table 2-2, the growth in the wholesale and retail or services sector where the temporary employment ratio is high is quite large [24]. Both of these industrial sectors show high Net Job Creation Rates exceeding 6% annually despite the fact that they reduced full-time employment during Fiscal 1993-1998.

**Table 2-2.   Net Job Creation by Industrial Sector (by Full-time and Part-time Employment)**

| | Full-time Net Job Creation Rate (Annual average, %) | | | | Temporary Net Job Creation Rate (Annual average, %) | | | | Temporary Job Ratio |
|---|---|---|---|---|---|---|---|---|---|
| Fiscal year | 78-83 | 83-88 | 88-93 | 93-98 | 78-83 | 83-88 | 88-93 | 93-98 | 98 |
| All industries | 0.4 | -0.0 | 1.9 | -1.7 | 4.0 | 2.6 | 2.1 | 4.4 | 29.8 |
| Manufacturing | 0.7 | -0.2 | 1.8 | -1.7 | 3.8 | 1.6 | -1.0 | -0.1 | 13.7 |
| Construction | 2.1 | -0.7 | 3.2 | -1.2 | -2.4 | -6.8 | 0.6 | -2.9 | 11.1 |
| Wholesale and retail | 0.6 | 0.8 | 2.3 | -1.9 | 5.6 | 4.3 | 3.5 | 6.5 | 53.9 |
| Transportation and telecommunications | -1.5 | -0.3 | 1.7 | -1.7 | 0.5 | -4.6 | 0.2 | 0.7 | 10.3 |
| Services | 0.9 | 1.3 | 3.1 | -0.1 | -0.8 | 6.1 | 5.8 | 6.0 | 50.5 |
| Other | -4.7 | -3.7 | -1.7 | -0.7 | -1.4 | -2.4 | -0.8 | 2.8 | 21.9 |

Notes:  1.   The Temporary Job Ratio is the ratio of the number of temporary employees as a percentage of all employees (full-time plus part-time).
2.   Excluding finance and insurance.

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[24] The Temporary Job Ratio in Table 2-2 appears much larger than the figures calculated using the *Labor Force Survey*. The principal reasons are believed to be the difference in the definition of "temporary employment" and the influence of the fact that the figures in Table 2-2 were calculated using only listed and public traded firms that provide information about temporary employment in their marketable securities reports.

## 3. Investigation of the Substitution of Full-time Employment with Temporary Employment

Think of the increased temporary employment at firms that reduced full-time employment as well as those that increased temporary employment as the "substitution of full-time employment with temporary employment", with the size of the reduction of full-time employment as the upper limit. Strictly speaking the phenomenon of an increase in temporary employment that accompanies the reduction of full-time employment cannot, in and of itself, be said to reflect the decision-making to substitute temporary employment for full-time employment. But we believe that an understanding of this substitution activity can provide some valuable information. Based on the above premise, we estimated the contribution from the "substitution of full-time employment with temporary employment" and have shown this in Table 2-3 contrasted with the Temporary Job Creation Rate.

### Table 2-3. Temporary Job Creation Rate Factor Analysis

(Unit: %)

| Fiscal year | Temporary Job Creation Rate | Substitution of full-time employment with temporary employment | Other |
|---|---|---|---|
| 78-83 | 5.5 | 1.1 | 4.4 |
| 83-88 | 5.0 | 1.0 | 4.0 |
| 88-93 | 3.9 | 0.2 | 3.7 |
| 93-98 | 5.8 | 1.1 | 4.7 |

Notes: 1. Increased temporary employment at firms that reduced full-time employment as well as those that increased temporary employment used as the "substitution of full-time employment with temporary employment", with the size of the reduction of full-time employment as the upper limit.
2. Excluding finance and insurance.
3. Annual average values.

The contribution from the "substitution of full-time employment with temporary employment" was 1.1% in Fiscal 1978-1983, 1.0% in Fiscal 1983-1988, 0.2% in Fiscal 1988-1993 and 1.1% in Fiscal 1993-1998. Despite the large decrease in the percentage in Fiscal 1988-1993 when demand for full-time employment temporarily rose, this shows the contribution for all other time periods to be at about 1%. Looking at Table 2-4, which shows this contribution level, is has remained stable at approximately 20% with the exception of Fiscal 1988-1993, with the remaining approximately 80% being explained by other factors. In other words, the phenomenon is believed to result from the increase in pure demand for temporary employment. Looked at by industrial sector, the contribution level from the "substitution of full-time employment with temporary employment" is conspicuously low in the wholesale and retail sector and the service sector, where the Temporary Job Ratio is high. In these industrial sectors the objective of replacing full-time employees is much lower than in other industrial sectors. So the fact that jobs that feel temporary employment is necessary are expanding can be regarded as the main factor causing the increase in temporary employment.

**Table 2-4.   Contribution Level of "Substitution of Full-time Employment with Temporary Employment" to the Temporary Job Creation Rate (by Industry Sector)**

(Unit: %)

| Fiscal year | 78-83 | 83-88 | 88-93 | 93-98 |
|---|---|---|---|---|
| All industries | 20.5 | 20.8 | 5.6 | 19.4 |
| Manufacturing | 23.9 | 43.1 | 16.4 | 37.8 |
| Construction | 0.0 | 7.8 | 0.2 | 37.8 |
| Wholesale and retail | 14.2 | 13.0 | 2.7 | 16.2 |
| Transportation and telecommunications | 85.3 | 0.0 | 13.2 | 38.4 |
| Services | 40.0 | 16.4 | 1.9 | 17.3 |
| Other | 57.7 | 86.1 | 3.1 | 31.9 |

Note:   Excluding finance and insurance.

We classified all firms into a group of firms that increased full-time employment (Full-time Job Creation Firms) and a group of firms that decreased full-time employment (Full Time Job Destruction Firms) and shows the Temporary Job Net Creation Rate for the respective groups. The Temporary Job Net Creation Rate is consistently higher for the Full-time Job Creation Firms than for the Full-time Job Destruction Firms, particularly in Fiscal 1993-1998, when in contrast to the Full-time Job Destruction Firms which remained at 2.3% the Full-time Job Creation Firms increased to 7.9%.

Two facts can be determined from the analysis so far. The first is the fact that the substitution of full-time employment with temporary employment is not very large when looked at on the basis of number of employees. Many temporary jobs are being created at firms that are increasing full-time employment, and the substitution of full-time employment with temporary employment did not exceed the 20% level of the Temporary Job Creation Rate. The second is the fact that the move to substitute full-time employment with temporary employment shows the same level of influence as in the 1980s when it had already appeared, meaning there has not been a more remarkably pronounced shift in the latter half of the 1990s. Because this substitution movement did weaken temporarily during the bubble era, however, the substitution effect can be said to be stronger in comparison to the start of the 1990s.

**Table 2-5.   Percentage Change in Temporary Employment by Increase or Decrease in Full-time Employment**

(Unit: %)

| Fiscal year | Firms that increased full-time employment | Firms that decreased full-time employment |
|---|---|---|
| 87-83 | 5.7 | 2.0 |
| 83-88 | 2.9 | 2.3 |
| 88-93 | 3.0 | -0.3 |
| 93-98 | 7.9 | 2.3 |

Notes:  1.   Excluding finance and insurance.
　　　　2.   Annual average values.

Next let us try to measure the size of the movement to substitute full-time employment with temporary employment by looking at the number of firms that made this change, rather than look at the number of employees.

We classified all firms into a group of firms that increased temporary employment (Temporary Job Creation Firms) and a group of firms that decreased temporary employment (Temporary Job Destruction Firms). The percentage of firms that reduced full-time employment in the respective groups of firms is shown in Table 2-6. The percentage of firms that reduced

full-time employment is consistently higher for Temporary Job Destruction Firms than it is for Temporary Job Creation Firms, a result that is consistent with the results achieved when we looked at by number of employees. If we focus here on the Temporary Job Creation Firms, the ratio of firms that reduced full-time employment moved in a range around 40% in Fiscal 1978-1983 and Fiscal 1983-1988. But after declining to nearly the 20% level in Fiscal 1988-1993, the ratio reversed course and soared to a level exceeding 50% in Fiscal 1993-1998. Even in the most recent three years, which are shown in Table 2-7, we can verify that among the firms that increased temporary employment more than half of the firms reduced full-time jobs.

From this analysis we can determine a third new fact. That is, in the latter half of the 1990s more than half of the firms increasing temporary jobs were decreasing full-time jobs, and looking at the number of firms we can say that the move to substitute temporary jobs has strengthened during the latter part of the 1990s.

### Table 2-6.   Percentage of Firms That Reduced Full-time Employment, by Increase or Decrease in Temporary Employment

(Unit: %)

| Fiscal year | Firms that increased temporary employment | Firms that decreased temporary employment |
|---|---|---|
| 87-83 | 40.5 | 63.3 |
| 83-88 | 44.4 | 53.8 |
| 88-93 | 22.6 | 32.9 |
| 93-98 | 56.0 | 76.1 |

Note:   Excluding finance and insurance.

### Table 2-7.   Number of Firms That Increased or Decreased Full-time Employment, Looked at by Increase or Decrease in Temporary Employment

(Unit: company; unit for numbers in parentheses: %)

| Fiscal year | | Sample firms | Firms that increased temporary employment | Firms that increased full-time employment | Firms that decreased full-time employment | Firms that decreased temporary employment | Firms that increased full-time employment | Firms that decreased full-time employment |
|---|---|---|---|---|---|---|---|---|
| 96 | Number of firms | 1,585 | 795 | 331 | 446 | 568 | 146 | 407 |
| | Component Ratio A | (100.0) | (50.2) | (20.9) | (28.1) | (35.8) | (9.2) | (25.7) |
| | Component Ratio B | - | (100.0) | (41.6) | (56.1) | (100.0) | (25.7) | (71.7) |
| 97 | Number of firms | 1,563 | 851 | 399 | 440 | 592 | 192 | 392 |
| | Component Ratio A | (100.0) | (54.4) | (25.5) | (28.2) | (37.9) | (12.3) | (25.1) |
| | Component Ratio B | - | (10.0) | (46.9) | (51.7) | (100.0) | (32.4) | (66.2) |
| 98 | Number of firms | 1,680 | 711 | 336 | 365 | 858 | 242 | 597 |
| | Component Ratio A | (100.0) | (42.3) | (20.0) | (21.7) | (51.1) | (14.4) | (35.5) |
| | Component Ratio B | - | (100.0) | (47.3) | (51.3) | (100.0) | (28.2) | (69.6) |

Notes:  1.   Shows the change compared to the prior fiscal year-end.
2.   Component Ratio A shows the component ratio for the total sample. Component Ratio B shows the component ratio for firms that increased temporary employment or firms that decreased temporary employment.
3.   Totals may not agree because there are some firms that did not change temporary employment or full-time employment.
4.   Excluding finance and insurance.

In the following paragraphs we examine the issue of what kind of firms displayed this move to substitute full-time employment with part-time employment. First let us observe the relationship between the average age of employees and the substitution of full-time employment

with temporary employment. We divided the firms in each industrial sector into two levels (Upper, Lower) using the average age of employees in Fiscal 1993 and measured the contribution level of "substitution of full-time employment with temporary employment" to the Temporary Job Creation Rate in Fiscal 1993-1998, using the same method we used for Table 2-4. We measured this by industrial sector because there are disparities in the average age of employees among industrial sectors. As seen in Table 2-8, the results showed that of the six industrial sectors, in the four sectors of manufacturing, wholesale and retail, transportation and telecommunications, and other, firms where the average age of employees was high had a strong tendency to substitute full-time employment with temporary employment.

Next let us examine the relationship between the average wage of employees and the substitution of full-time employment with temporary employment. We classified the firms into two levels (High, Low) by the average wage of employees in Fiscal 1993, and measured the contribution level to "substitution of full-time employment with temporary employment" in the Fiscal 1993-1998 time frame in the same manner as for average age of employees. As can be seen from the results shown in Table 2-9, in all six industrial sectors the tendency to substitute full-time employment with temporary employment was strongest in the group of firms with a high average wage.

From the results of the above analysis we can see that the tendency for firms to rely on lower cost and flexible temporary employees or employees seeking part-time work and side jobs, rather than employ permanent, full-time employees when workers retire or are laid off, is strong at firms with high average employee age or wages. It is difficult to think that firms use temporary employment as a substitute for high wage, trained workers when firm-specific skills acquired through OJT (on the job training) or experience unique to a firm have lifted the marginal productivity of labor, which is reflected in the wages paid. The results of this paper in which such a phenomenon can be seen, however, do suggest that for firm management, the move to adjust the suitable percentages of employees who have a firm-specific skill and those who do not is strong.

**Table 2-8.   Contribution Level of Temporary Job Creation Rate (Fiscal 1993-198) (Classified According to Average Age of Employees)**

|  |  | Substitution of full-time employment by temporary employment | Other |
|---|---|---|---|
| Manufacturing | High | 76.6 | 23.4 |
|  | Low | 15.8 | 84.2 |
| Construction | High | 29.8 | 70.2 |
|  | Low | 42.5 | 57.5 |
| Wholesale and retail | High | 41.7 | 58.3 |
|  | Low | 10.5 | 89.5 |
| Transportation and telecommunications | High | 100.0 | 0.0 |
|  | Low | 31.7 | 68.3 |
| Services | High | 21.3 | 78.7 |
|  | Low | 22.9 | 77.1 |
| Other | High | 100.0 | 0.0 |
|  | Low | 23.3 | 76.8 |

(Unit: %)

Notes: 1.   Shows contribution level by classifying firms into two roughly equal classifications (High, Low) based on average age of employees in each industry and analyzing Temporary Job Creation Rate factors for each respective group of firms during Fiscal 1993-1998 as "substitution of full-time employment with temporary employment" and "other causes".
2.   Excluding finance and insurance.

**Table 2-9.  Contribution Level of Temporary Job Creation Rate (Fiscal 1993-1998) (Classified by Average Wage of Employees)**

(Unit: %)

|  |  | Substitution of full-time employment with temporary employment | Other |
|---|---|---|---|
| Manufacturing | High | 57.6 | 42.4 |
|  | Low | 17.8 | 82.2 |
| Construction | High | 60.5 | 39.5 |
|  | Low | 31.1 | 68.9 |
| Wholesale and retail | High | 19.1 | 80.9 |
|  | Low | 13.3 | 86.7 |
| Transportation and telecommunications | High | 92.3 | 7.7 |
|  | Low | 33.8 | 66.2 |
| Services | High | 24.8 | 75.2 |
|  | Low | 22.2 | 77.8 |
| Other | High | 66.9 | 33.1 |
|  | Low | 31.8 | 68.2 |

Notes:  1.  Shows contribution level by classifying firms into two roughly equal classifications (High, Low) based on average monthly wage of employees in each industry and analyzing Temporary Job Creation Rate factors for each respective group of firms during Fiscal 1993-1998 as "substitution of full-time employment with temporary employment" and "other causes".

2.  Excluding finance and insurance.

**Conclusion**

In this paper we observed the factors that influence the Job Creation Rate and the Job Destruction Rate by using data for listed and publicly traded individual firms. We also added an analysis of the tendency to utilize temporary employment, which has shown strong growth since the 1980s. We have summarized the conclusions drawn from the results as follows.

First, we shows important factors that are influencing the Job Creation Rate and Job Destruction Rate.

1. Important factors influencing job creation at firms include, in addition to the firm's business expansion or operating results such as firm profitability, a comparatively small size, young company age, and young average age of employees.
2. In addition to these factors, during the 1990s the health of a firm's financial structure has been increasing in importance.
3. During the years of Japan's bubble economy, the Job Creation Rate rose and the Job Destruction Rate declined overall without regard to whether a firm was large or small or young or old, or whether the average age or average wage of the employees was high or low. This singular tendency of the bubble era was particularly conspicuous at firms with a long history or firms where the average age of company employees was high. The change of circumstances at these firms after the collapse of the bubble economy to a situation where labor demand is stagnant has been remarkable.

In addition, we observed the following results with regard to temporary employment.

4. Much temporary employment is being created by firms where full-time employment is increasing, to the extent we can see based on number of employees the substitution of full-time employment by temporary employment is not that great.
5. Looked at by number of firms a move to substitute using temporary employment is clearly visible, and during the latter half of the 1990s more than half of all firms that increased temporary employment have been decreasing full-time employment.
6. This move towards this kind of job substitution can be most clearly seen at firms where the average age of employees is high or at firms where the average wage of employees is high.

Because the above results were deduced from an analysis of data that was limited to firms that are listed and publicly traded on a stock exchange, care should be prudently exercised when applying these results to all Japanese firms. For example, although a result was derived from the results of this paper showing that comparatively small-sized firms are increasing employment, this does not mean that this result is applicable to all small and medium-sized firms in Japan. To obtain this kind of result one must make a careful analysis using data for unlisted small and medium-sized firms. There are also small firms of less than 100 employees among the listed and public traded firms as well, although only a handful when one looks at all Japanese firms, and more attention should also be directed to those superior firms that have cleared the high hurdles required to list and publicly trade their stock.

In addition to these considerations, the following implications can be reached. In order to improve the Job Creation Rate, it will be important to cultivate young firms that possess strong growth potential, promote the commercialization of creative and unique ideas through measures such as deregulation, or create an environment that promotes new business start-up activity.

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# Appendix

## 1.  Sample Bias

For this paper we conducted an analysis focused on listed and publicly traded firms. Prudent caution must be exercised when applying the analytical results to all firms in Japan because of sample bias. The bias is particularly large in the case of firm size.

Commentary Figures 1-1 and 1-2 are charts that compare the composition of listed and public traded firms aggregated by number of employees to the composition for all Japanese firms. For the data for all Japanese firms we used the *Establishment and Enterprise Census* from the Management and Coordination Agency. When examined by the number of companies, more than 90% of all Japanese firms are concentrated in the categories for less than 50 employees. In contrast, among listed and publicly traded firms there are almost no firms with less than 50 employees, and approximately 40% of all listed and publicly traded firms are concentrated in the 300-999 employees category. When looked at by number of employees based on number of employees per firm, in contrast to all Japanese firms where employees are distributed roughly evenly across every category, at listed and publicly traded firms more than 50% of all employees are concentrated in the category of firms with 5,000 or more employees.

## Commentary Figure 1-1.   Composition of Firms, Based on Number of Employees



(Number of employees, individuals)

Listed and publicly traded firms

Establishment and enterprise statistics

(Composition by number of companies, %)
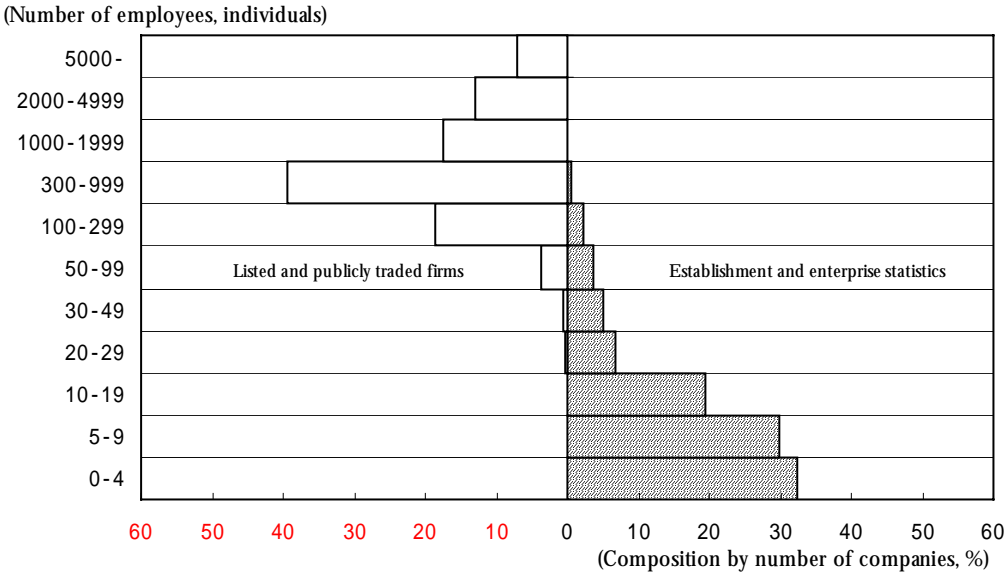
## Commentary Figure 1-2.　Composition of Employees, Based on Number of Employees per Firm

(Number of employees, individuals)
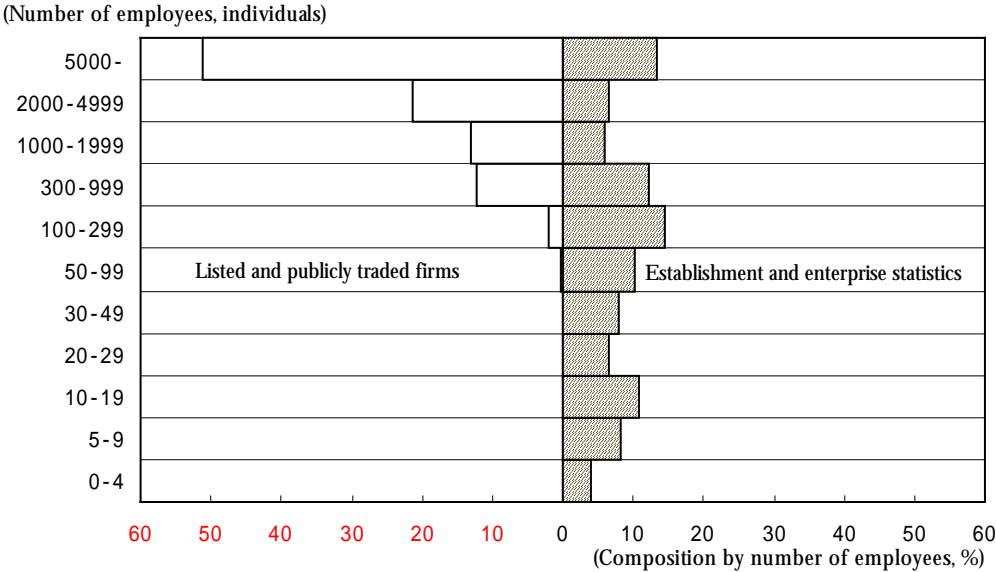


Notes: 1.　Based on Single-Unit and Head-Office Unit and Domestic Branch-Office by associating together or being legally incompatible tabulation incorporated enterprises in Company Totals (Results of Incorporated Enterprises), *Establishment and Enterprise Census*, Management and Coordination Agency

2.　"Number of employees" indicates number of employees at fiscal year-end for listed and publicly traded companies, and number of full-time employees for the business establishment and firms statistics.

## 2.　The Job Destruction Rate Taking Business Bankruptcies and Shutdowns into Account

The Job Creation Rate and Job Destruction Rate shown in Table 1-2 of this report are figures derived for only firms that continued in business. Because the analysis was conducted within the range of listed and publicly traded firms it is not possible to analyze the growth of employment that accompanied new firm start-ups. It is possible, on the other hand, to grasp the decline in employment that accompanied bankruptcies, business shutdowns or other causes based on the following assumptions.

Assumption #1　Treat all firms that ceased being publicly traded and were delisted, for reasons such as legal proceedings including corporate reorganizations, or because of the cessation of banking transactions, as bankrupt and terminated firms.

Assumption #2　Treat the number of employees of these firms at fiscal year-end as job destruction.

　　We added the job destruction that resulted based on these assumptions and determined the Job Destruction Rate a second time. The results were as shown in Commentary Figure 2-1.

　　Because the number of cases of firms that went bankrupt or ceased business was not that great and the size of bankrupt firms was also not very large up until Fiscal 1996, the difference between the Job Destruction Rate for on-going firms only and the Job Destruction Rate considering bankruptcies or business shutdowns was not very large. From Fiscal 1997 onward, however, the difference between both Rates widened because of the rise in bankruptcies and

business shutdowns as well as the occurrence of large-scale bankruptcies. In Fiscal 1998, the Job Destruction Rate climbed by about 0.4% points when compared to the case that does not take bankruptcies and business shutdowns into consideration.

**Commentary Figure 2-1.    Job Destruction Rate When Bankruptcies and Business Shutdowns are Considered**
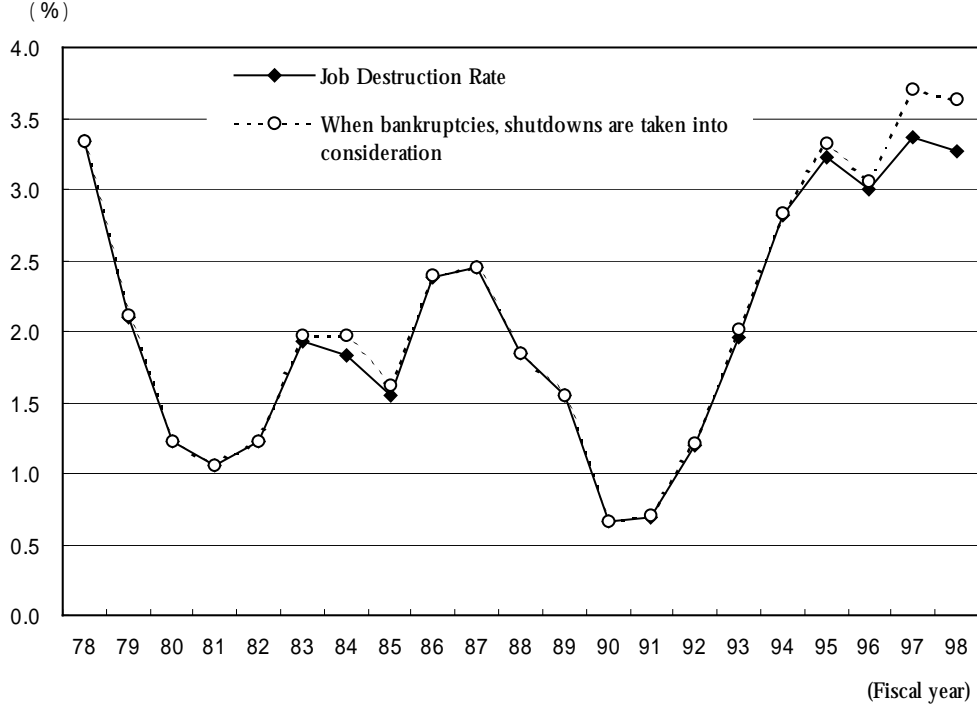
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