

Title	The employment adjustment in Japanese manufacturing industries in the 1970s
Sub Title	
Author	清家, 篤 (Seike, Atsushi)
Publisher	
Publication year	1985
Jtitle	Keio business review Vol.22, (1985.) ,p.25- 57
JaLC DOI	
Abstract	
Notes	
Genre	Journal Article
URL	https://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260481-19850000-03920097

慶應義塾大学学術情報リポジトリ(KOARA)に掲載されているコンテンツの著作権は、それぞれの著作者、学会または出版社/発行者に帰属し、その権利は著作権法によって保護されています。引用にあたっては、著作権法を遵守してご利用ください。

The copyrights of content available on the KeiO Associated Repository of Academic resources (KOARA) belong to the respective authors, academic societies, or publishers/issuers, and these rights are protected by the Japanese Copyright Act. When quoting the content, please follow the Japanese copyright act.

THE EMPLOYMENT ADJUSTMENT IN JAPANESE MANUFACTURING INDUSTRIES IN THE 1970s*

by

Atsushi Seike

- I. Introduction
- II. Employment Fluctuations in Japanese Manufacturing Industry in the 1970s
 - II-1. Aggregate fluctuations
 - a) A long term trend
 - b) Short term fluctuations
 - c) Hours worked
 - II-2. Employment fluctuations by manufacturing industries
- III. The Econometric Analysis of Employment Adjustment
 - III-1. Model
 - III-2. The data and selected industries
 - III-3. The basic empirical findings
 - III-4. Intertemporal and international comparison of employment adjustment
 - a) Comparison of pre- and post- oil crisis employment adjustment in Japanese manufacturing industries
 - b) Comparison of employment adjustment between Japanese and US manufacturing industries
- IV. The Employment Adjustment Measures
 - IV-1. The organization of measures concerning employment adjustment
 - IV-2. The performance and evaluation of employment adjustment measures

I. Introduction

In the 1970s, Japanese manufacturing industries experienced large fluctuations in production. Despite a short recession in 1971, aggregate manufacturing production kept

* This paper is a revised version of a paper presented at the policy evaluation panel of OECD on "Measures to assist workers displaced by structural change" held on 30 – 31 January 1984. I thank Mr. Dymond, the Chairman of the panel, and other experts participating in the panel for their helpful comments.

increasing in the early years of the 1970s, and reached its highest level in 1973. When the first oil crisis came towards the end of 1973, manufacturing production showed a sharp decline. After reaching its bottom in early 1975, production in manufacturing industries again began to exhibit an upward trend, and recovered to its previous peak level. There was a short depression in 1978, and the second oil crisis took place in 1979. However, this crisis did not have as large an impact on the Japanese economy as the previous one did.

Manufacturing employment, a derived demand from production, was naturally affected by those fluctuations. The impact of the first oil crisis on employment is especially interesting because a recession of this magnitude occurred after almost 20 years of continuous growth. What are the major features of employment adjustment in Japanese manufacturing industries? How do they differ by industry? How are they different in the pre- and post-oil crisis period? Finally, how does employment adjustment in Japan differ from that in other countries? This report seeks to provide some understanding of characteristics of employment adjustment in Japanese manufacturing industries, and to make some tentative policy evaluations given these features of employment adjustment.

The following section provides a concise review of recent employment fluctuations in Japanese manufacturing industries both on the aggregate level and also on the 2-digit disaggregated level. In section 3, I make an econometric analysis of employment adjustment, and in the final section, review and discuss the employment adjustment subsidies of the Japanese Ministry of Labor.

II. Employment Fluctuations in Japanese Manufacturing Industries in the 1970s

II-1. Aggregate fluctuations

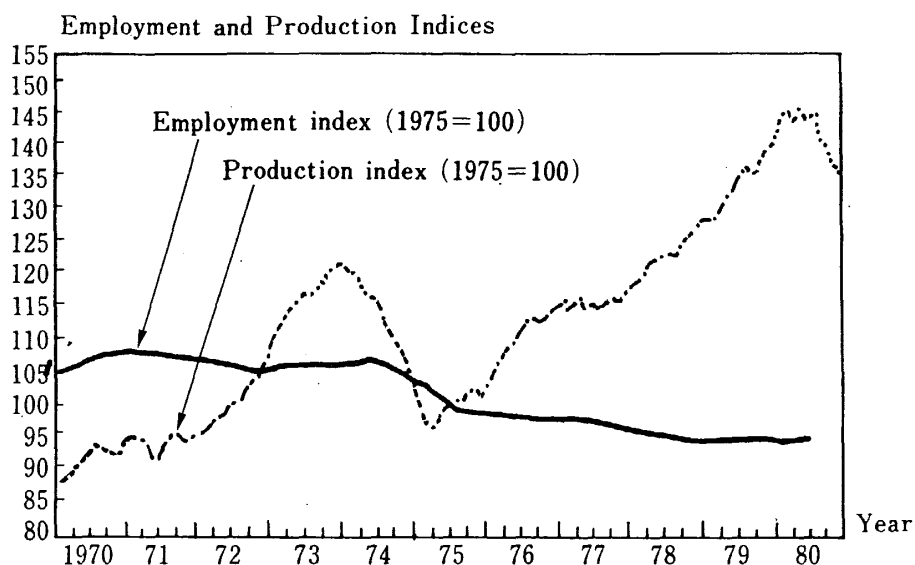
Aggregate indices of production (dotted line) and employment (solid line) in Japanese manufacturing industries in the 1970s are shown in Fig. 1. Both indices use seasonally adjusted monthly data with 1975=100.

a) A long-term trend

According to Fig. 1, there is a long term downward trend in manufacturing employment in the 1970s. After reaching its peak in the beginning of 1971, the manufacturing employment showed a mild but steady downward trend with the exception of a temporary slight increase in employment from 1973 to 1974. It may be noteworthy that this downward trend in employment is observed throughout the 1970s, including both the recession period due to the first oil crisis and the growing phases of production in the pre-oil crisis period and in the recent fullscale recovering period.

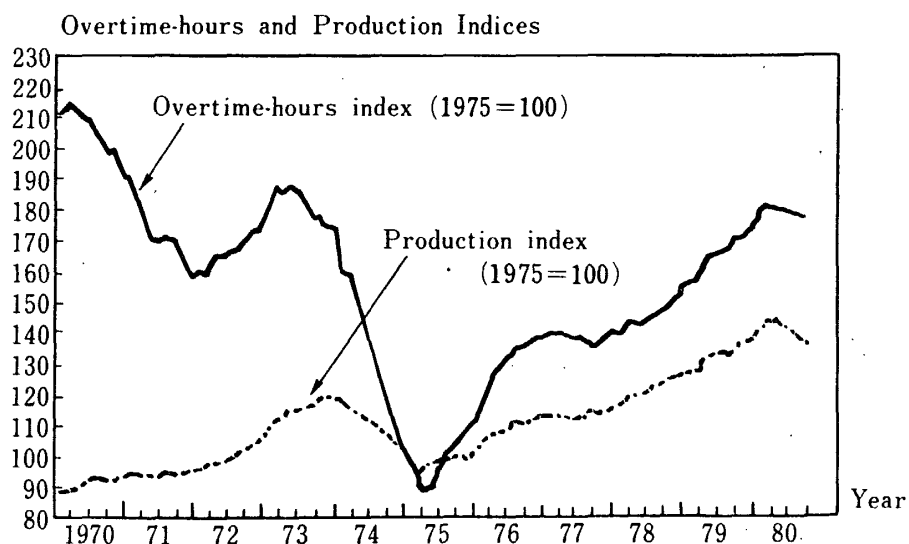
This suggests not only a simple substitution of capital for labor but also shows the impact of the recent development in labor-saving technology on employment. However, the diminishing rate of employment has become smaller and there seems to be symptoms of an increase in employment in 1980. Therefore, it may be safer for us to watch this trend for a while longer before we regard it as a permanent trend in manufacturing

Fig. 1. Fluctuations in Employment and Production
(Aggregate manufacturing industry)



Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 2. Fluctuations in Overtime-hours and Production
(Aggregate manufacturing industry)



Source: Overtime-hours index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (Dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

employment in Japan.

b) Short-term fluctuations

In addition to the long-term trend reviewed above, manufacturing employment also fluctuates according to production fluctuations at any moment. The features of these short term fluctuations shown in Fig. 1 are summarized as follows:

- *With a one year lag from the recession in 1971, the manufacturing employment index showed a shallow trough in 1972.
- *After reaching the bottom of this shallow trough in the end of 1972, manufacturing employment increased slightly until the middle of 1974, half a year since the first oil crisis occurred.
- *With a half year lag from the decline in production due to the first oil crisis, manufacturing employment began to decline again in the latter half of 1974.
- *Manufacturing employment kept declining even after passing the mid-point of 1975 when manufacturing production showed an upward trend again.
- *After that, manufacturing employment remained stagnant although the diminishing rate of employment became smaller.
- *A tendency towards an increase in manufacturing employment, however, can be seen in 1980.

Two conspicuous characteristics can be seen in the observation of employment fluctuations above. First, manufacturing employment does not simultaneously respond to changes in manufacturing production, but responds to them with a time lag of one half to one year. Second, the ranges in employment fluctuations are relatively small compared to that of production fluctuations. In other words, the elasticity of employment to production is far less than one.

c) Hours worked

The cause of the lagged response and the small elasticity of employment to production is the great flexibility in hours worked per worker in Japanese manufacturing industries. Fig. 2 shows indices of production (dotted line) and per capita overtime hours worked (solid line). Both indices use seasonally adjusted monthly data with 1975=100. As seen in Fig. 2, overtime hours move almost parallel to, and very elastically with, production. This suggests that the employment practice of having a relatively large amount of overtime work even in phases of normal demand is wide-spread among Japanese manufacturing firms. Obviously, this large degree of freedom in working hours enables employment to fluctuate more mildly to meet production fluctuations.

II-2. Employment fluctuations by manufacturing industries

Figures 3 to 18 show fluctuations in employment of 2-digit manufacturing industries in Japan in the 1970s (solid lines). Production fluctuations (dotted lines) are also shown in the same fashion as in Fig. 1. All indices use seasonally adjusted data with 1975=100.

Looking over Figures 3 to 18, it can be seen that the pattern of employment fluctua-

tions varies widely.¹⁾ Before turning our attention to the difference in employment fluctuations among industries, however, it is necessary to note the fact that they have some common characteristics. These are the lagged response and the inelasticity of employment to production (though the textile industry and the lumber industry are exceptions for the latter).²⁾ Needless to say, these are the same features we have found above for employment fluctuations in aggregate terms in manufacturing industries.

Looking at Figures 3 to 18, it is possible to divide them into several patterns. These are:

- * Industries which show almost the same pattern as the aggregate results: — pulp and paper, chemicals and allied products, rubber and misc. plastic products, stone clay and glass products, steel industries, nonferrous metal industries, fabricated metal products, machinery except electrical.
- * Industries whose employment increased slightly hand in hand with the recovery of production after the middle of 1975: — Food and kindred products, electric and electronic equipment, instruments and related products.
- * Industries whose employment shows a sharp decline through the 1970s because of their structural depressions: — textile mill products, lumber and wood products.
- * Others: — petroleum and coal products, leather and leather products, transportation equipment.

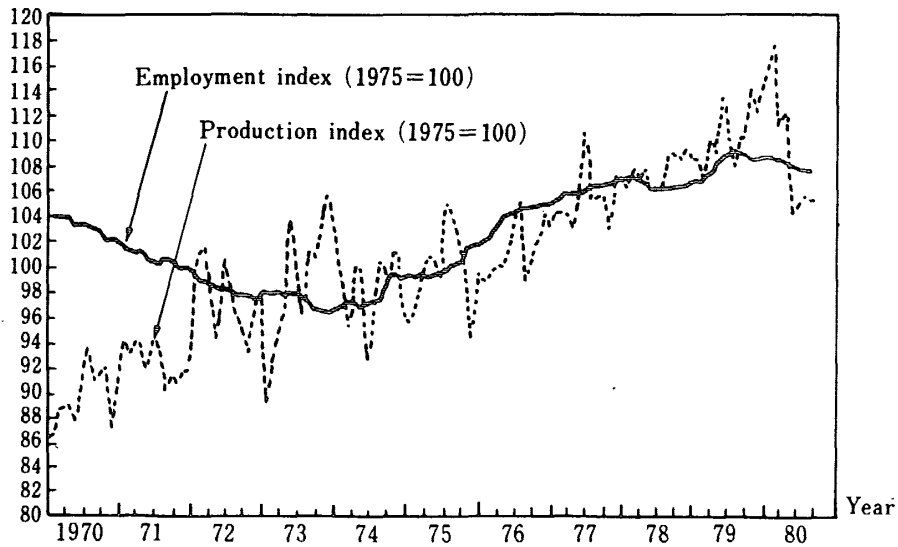
Evidently the variety in the pattern of employment fluctuations by industry is provided fundamentally by their different fluctuation patterns in production. However, the difference in each industry's particular manner of employment fluctuation, especially their lag pattern and size of elasticity to production — may be fairly attributed to the nature of technology used for production, human capital management and other employment practices of each industry.

In this section, I found that there was a fairly long time lag and little elasticity of employment in response to production fluctuations in Japanese manufacturing industries in the 1970s. Secondly, the pattern of employment fluctuation differed among industries at the 2-digit level although they shared the common features of a lagged response and little elasticity of employment. Needless to say, these features of employment fluctuation are reflections of each firm's respective employment adjustment behavior. In the next section, I will examine this employment adjustment by using a behavioral model of the firm.

1) For international comparison, see the case in US manufacturing industries shown in Appendix A. More similarity can be seen in employment adjustment pattern among industries in the US.

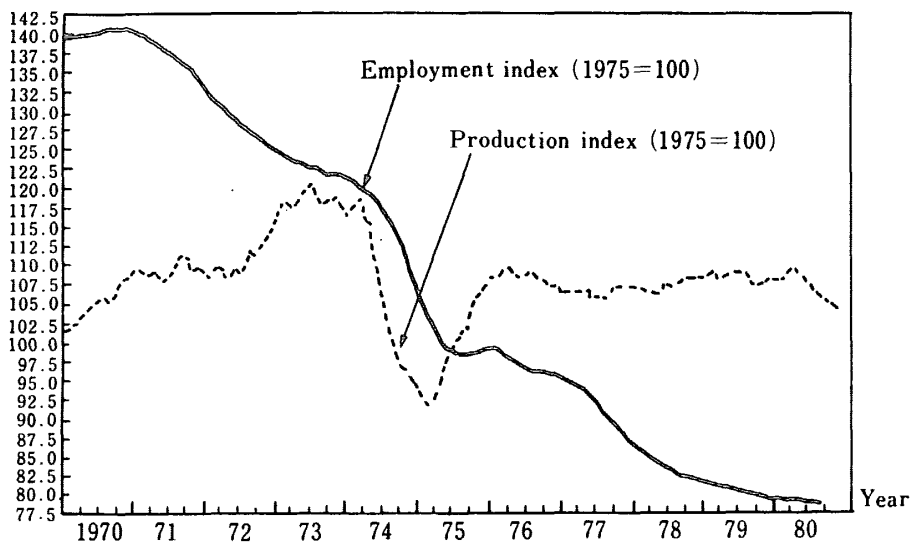
2) For international comparison of this lag pattern and elasticity of employment, see the case in US manufacturing industries shown in Appendix A. They show more quick and elastic response of employment to fluctuations in production.

Fig. 3. Fluctuations in Employment and Production
1. Food and kindred products



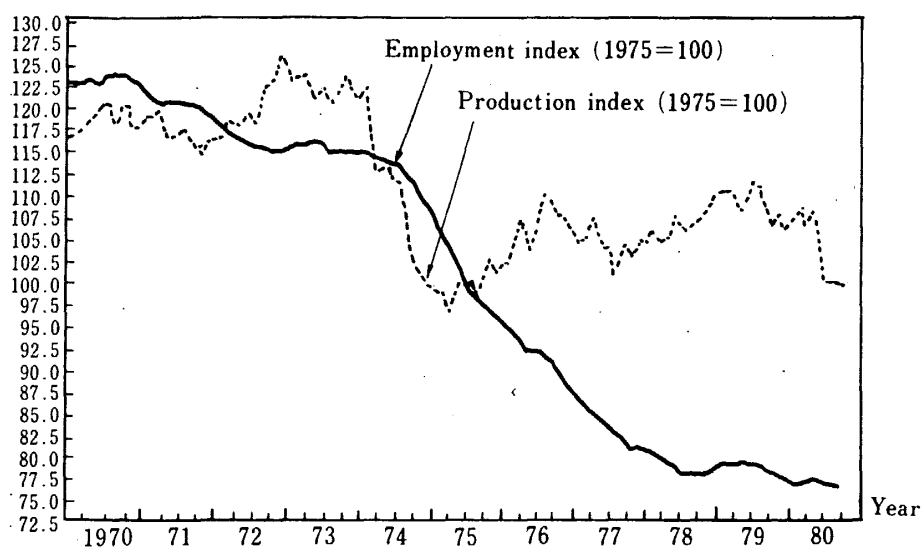
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 4. Fluctuations in Employment and Production
2. Textile mill products



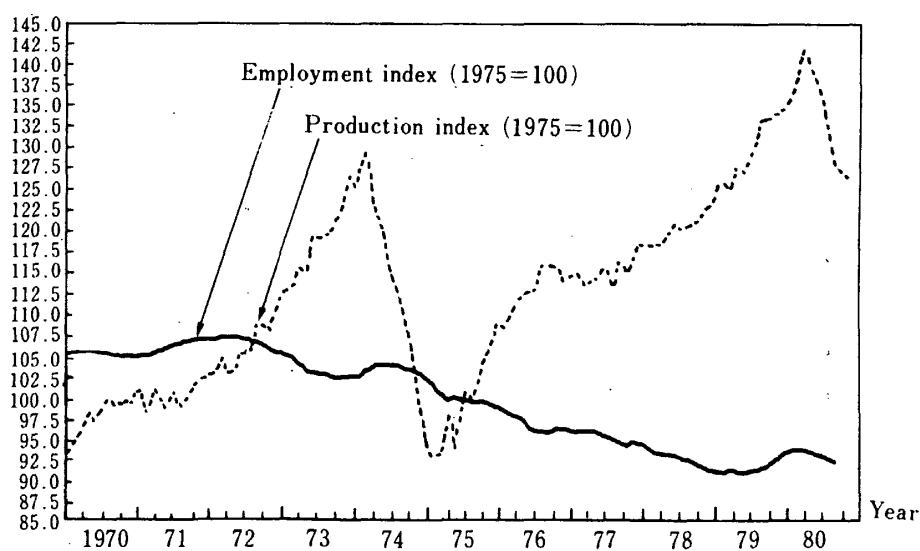
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 5. Fluctuations in Employment and Production
3. Lumber and wood products



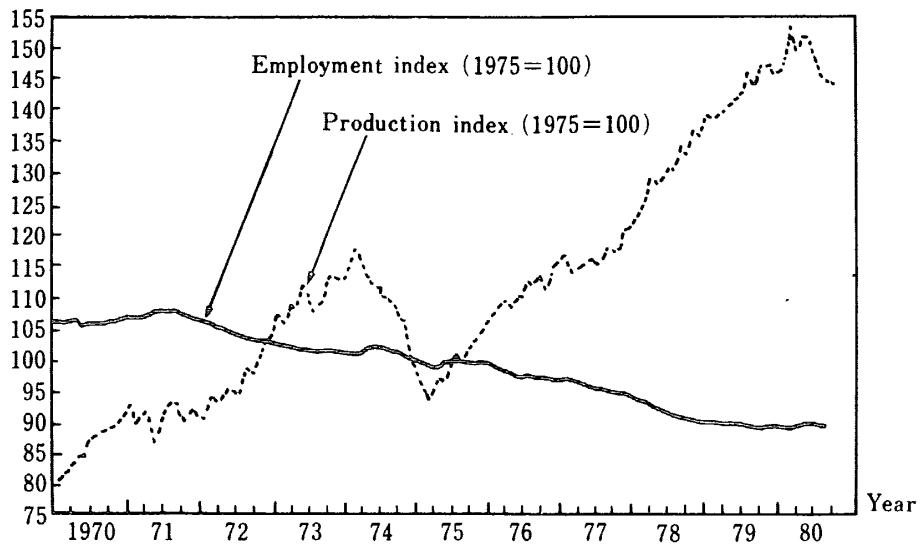
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 6. Fluctuations in Employment and Production
4. Paper and allied products



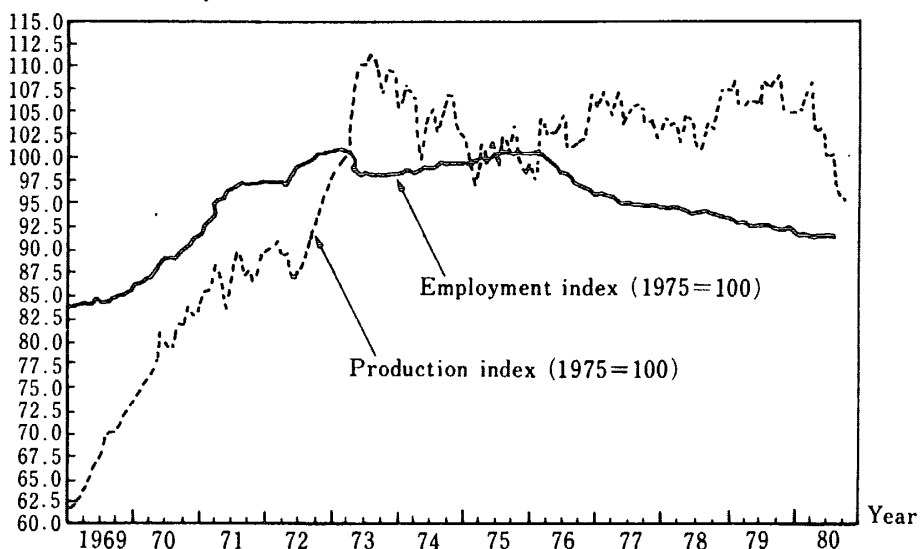
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 7. Fluctuations in Employment and Production
5. Chemicals and allied products



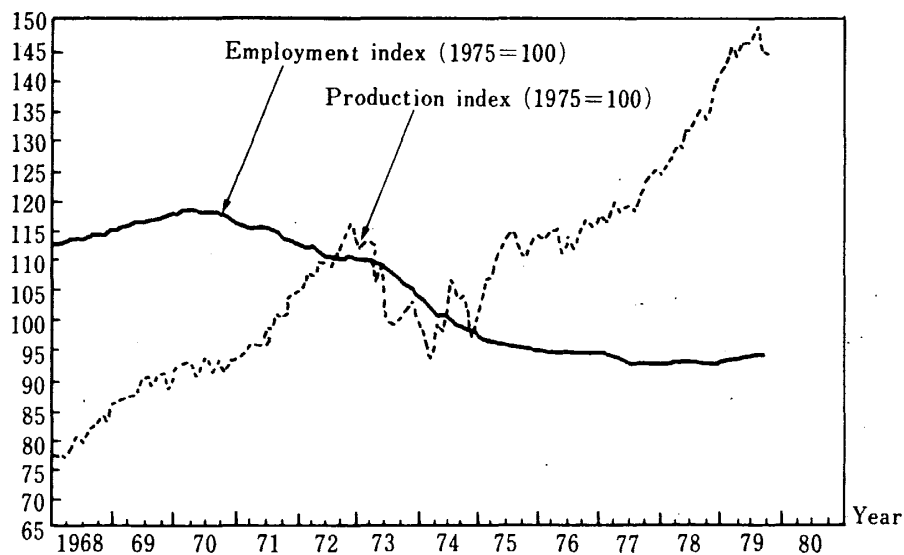
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 8. Fluctuations in Employment and Production
6. Petroleum and coal products



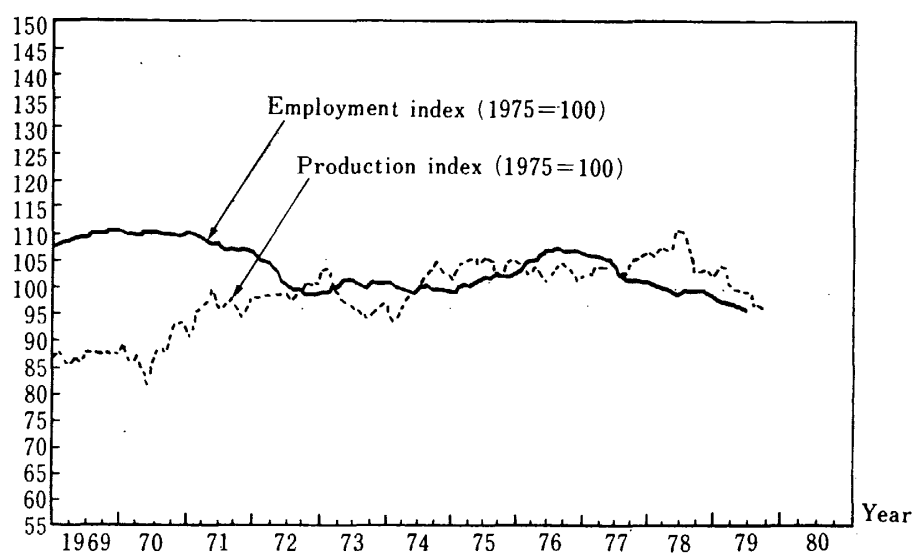
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 9. Fluctuations in Employment and Production
7. Rubber and misc. plastic products



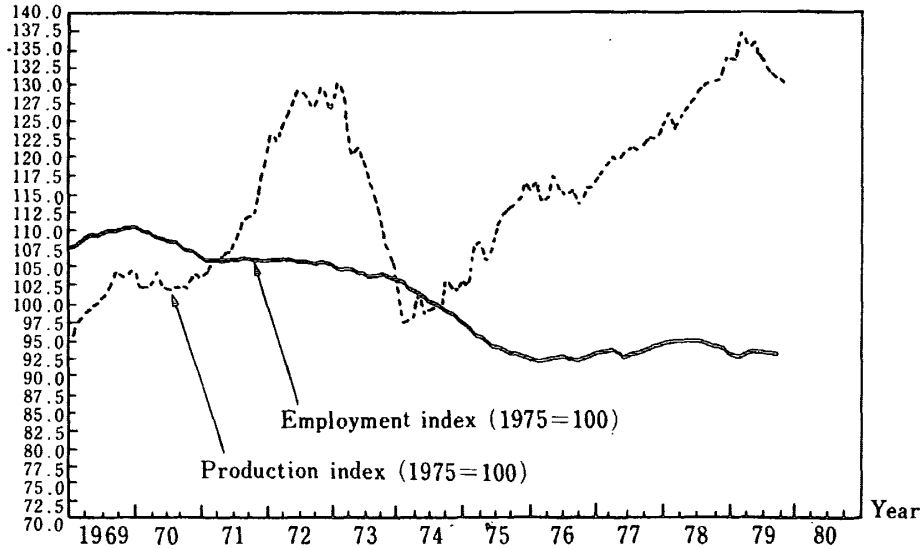
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 10. Fluctuations in Employment and Production
8. Leather and leather products



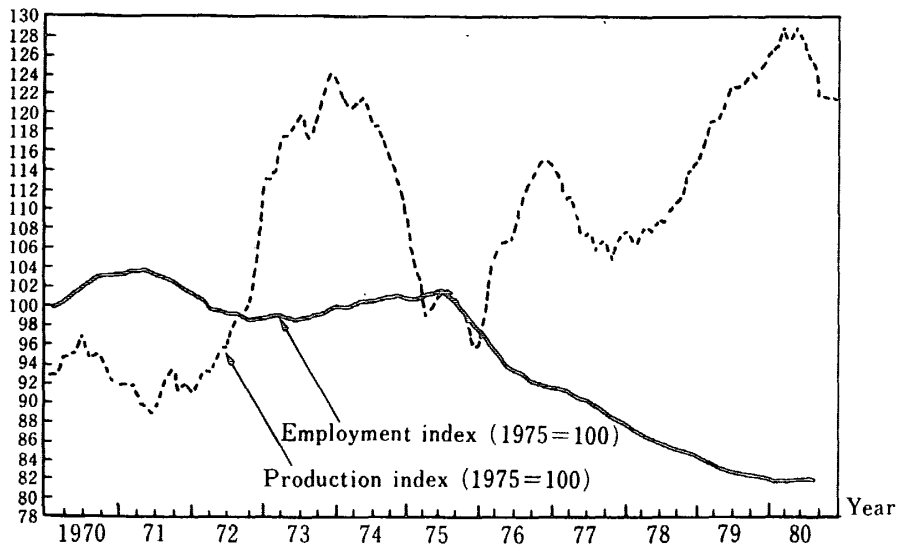
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 11. Fluctuations in Employment and Production
9. Stone, clay and glass products



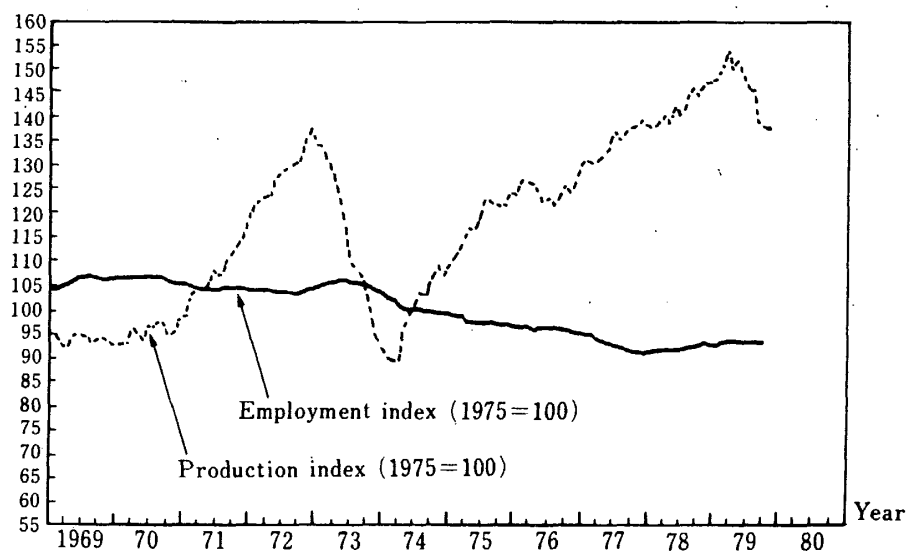
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistic Monthly): The Ministry of International Trade and Industry

Fig. 12. Fluctuations in Employment and Production
10. Steel products



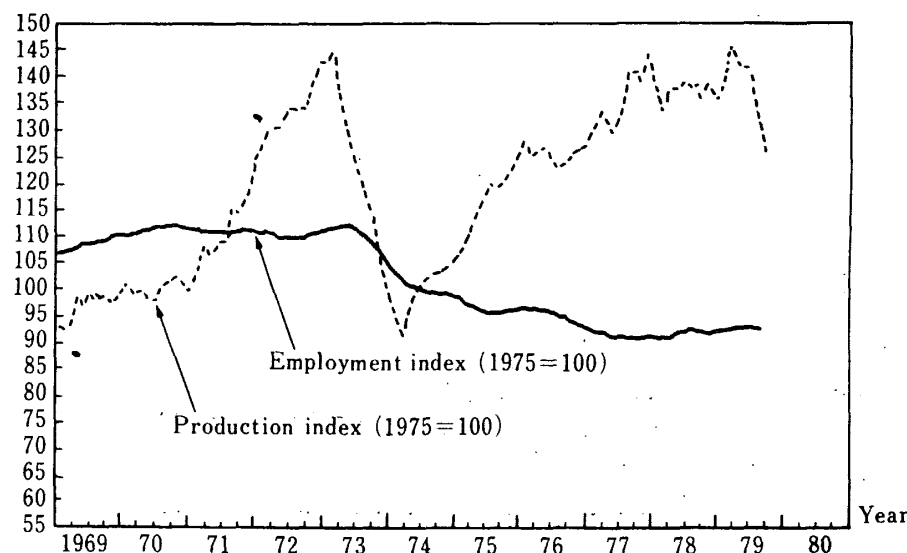
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 13. Fluctuations in Employment and Production
11. Nonferrous metal products



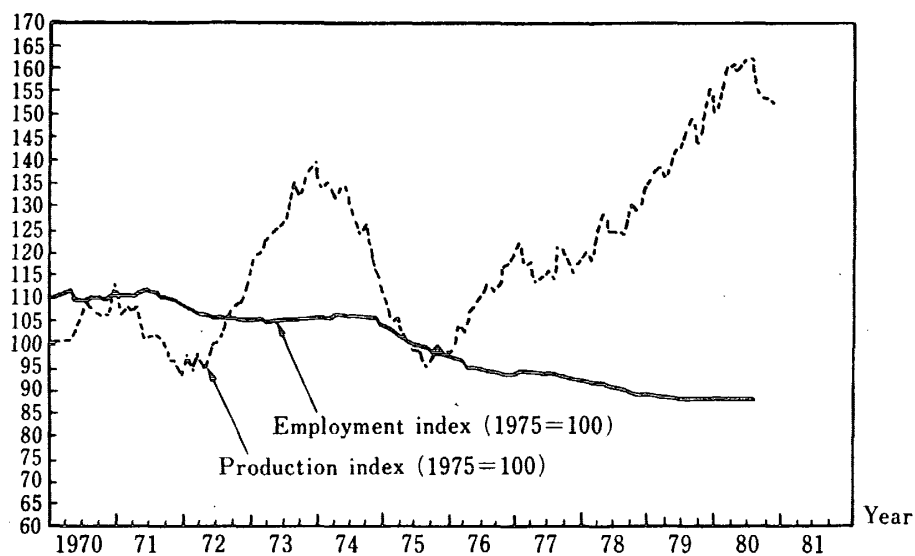
Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusun Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 14. Fluctuations in Employment and Production
12. Fabricated metal products



Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusun Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 15. Fluctuations in Employment and Production
13. Machinery, except electrical

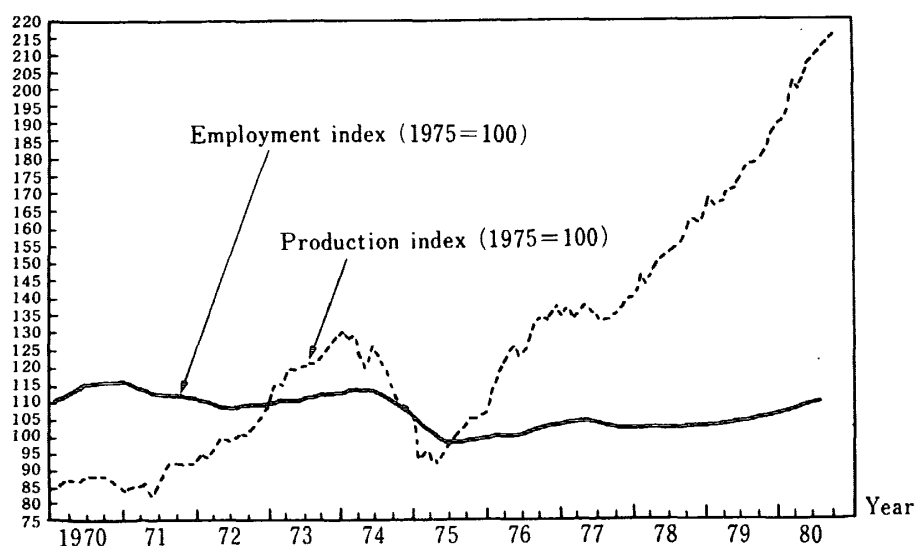


Source: Employment index (solid line) —

Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
Production index (dotted line) - - - -

Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 16. Fluctuations in Employment and Production
14. Electric and electronic equipment

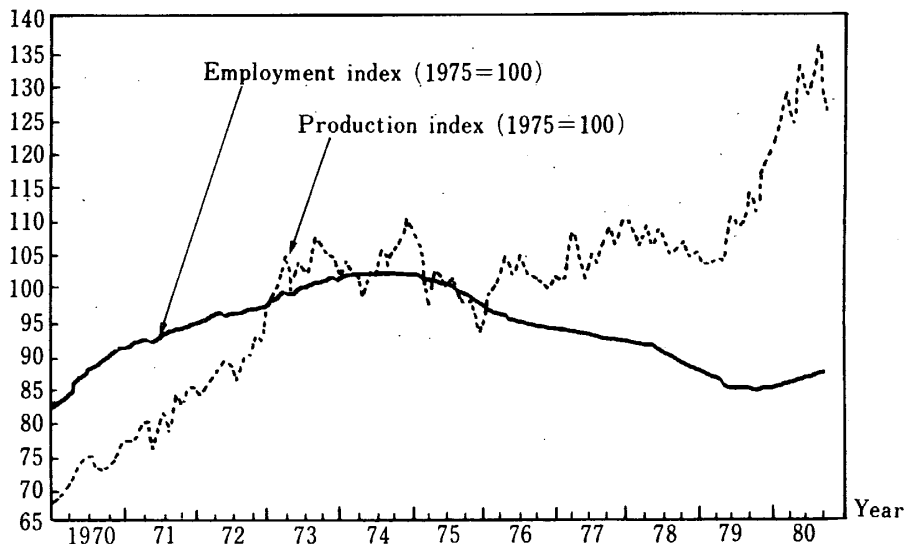


Source: Employment index (solid line) —

Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
Production index (dotted line) - - - -

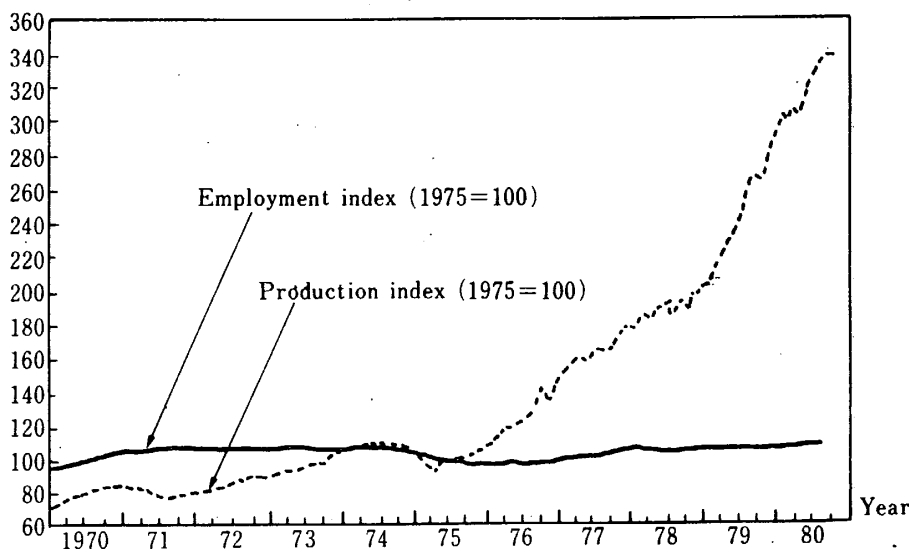
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 17. Fluctuations in Employment and Production
15. Transportation equipment



Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

Fig. 18. Fluctuations in Employment and Production
16. Instruments and related products



Source: Employment index (solid line) ———
Maigetsu Kinro Tokei (Monthly Employment and Earnings Survey): The Ministry of Labor
 Production index (dotted line) - - - - -
Tsusan Tokei (The Industrial Statistics Monthly): The Ministry of International Trade and Industry

III. The Econometric Analysis of Employment Adjustment

III-1. Model

This section makes an econometric analysis of employment adjustment in Japanese manufacturing industries. The estimation is based on the short-term labor demand model developed by Fair (1969). Since this model attempts to explain the short-term labor demand of firms by using the concept of excess labor, we will hereafter call it an excess labor model (ELM).³⁾

The ELM has the form

$$(1) \ln M_t - \ln M_{t-1} = v (\ln M_{t-1} - \ln M_{t-1}^d) \\ + \sum_{i=0}^n b_i (\ln X_{t+i}^e - \ln X_{t+i-1}^e) \\ + \sum_{j=1}^m c_j (\ln X_{t-j} - \ln X_{t-j-1})$$

where M_t is the actual employment, M_t^d is the optimal employment, X_t is the actual output, X_t^e is the expected output, v , b_i , c_j are parameters, and t is the month suffix. This model shows that the employment adjustment of a firm at a certain period, namely from month $t-1$ to month t , depends on the amount of excess labor at hand (the first term on the right in eq. (1)), expected output fluctuations in the future forecast in month $t-1$ (the second term on the right in eq. (1)), and the fluctuations of output in the past period as proxies of excess labor in the past (the third term on the right in eq. (1)). The restrictions of signs of parameters in eq. (1) are shown as follows. Firstly, the parameter v of the excess labor term must be negative, because if a firm had positive excess labor (labor surplus) it would try to reduce its work force and if it had negative excess labor (labor shortage) it would try to hire new employees, *ceteris paribus*. The parameters b_i must be positive, because a firm would try to increase employment if it expected its output might increase in the future, *ceteris paribus*. And the parameters c_j must also be positive since a positive change in output in the past means there was negative excess labor and vice versa.

There may be two reasons why the firm hoards excess labor. One is the frictional cost of employment adjustment and the other is the uncertainty of future output. The parameter v of eq. (1) represents the effect of adjustment cost on employment adjustment. Though there may be a lot of adjustment cost factors, they are mainly: (i) restrictions on employment contracts, (ii) manners and technology of production, and characteristics of human capital required by them, (iii) transaction costs due to new hiring, recalls lay offs, change of organizations, etc., and (iv) lower morale due to employment fluctuations. The parameter v of eq. (1) means that because of these adjustment costs, the firm can not

3) For more detail in the model, see the chapter 3 of Fair (1969).

clear all excess labor at hand but only $100 \times v$ percent of it. In this section, I analyze the employment adjustment behavior of Japanese and US manufacturing firms from the view of adjustment cost by examining the absolute values of the parameter v .

III-2. The data and selected industries

In this section we estimate eq. (1) for two-digit Japanese manufacturing industries using monthly data from 1969 to 1979.⁴⁾ The industries we analyzed are:

1. Food and kindred products
2. Textile mill products
3. Lumber and wood products
4. Paper and allied products
5. Chemicals and allied products
6. Petroleum and coal products
7. Rubber and misc. plastic products
8. Leather and leather products
9. Stone, clay and glass products
10. Steel products
11. Nonferrous metal products
12. Fabricated metal products
13. Machinery, except electrical
14. Electric and electronic equipment
15. Transportation equipment
16. Instruments and related products

For numbers of employment and hours worked in Japanese manufacturing industries, I took data from *Maigetsu Kinro Tokei* (Monthly Employment and Earnings Survey) published by the Japanese Ministry of Labor. For indices of manufacturing outputs I took data from *Tsusan Tokei* (The Industrial Statistics Monthly) published by the Japanese Ministry of International Trade and Industry.

III-3. The basic empirical findings

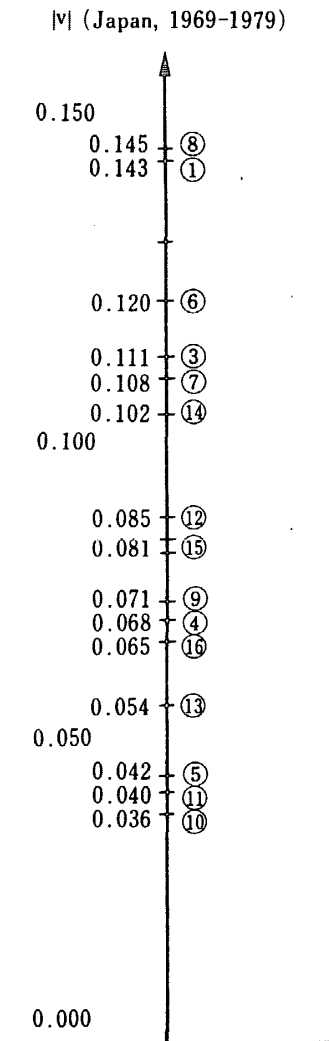
Fig. 19 shows the absolute values of the parameter v derived from estimation results of eq. (1) for two-digit Japanese manufacturing industries. The vertical axes in Fig. 19 represent the absolute value of v s from 1969 to 1979. In cases where the sign of v was positive, or its significance was lower than 5% significant level, $|v|$ is not shown in Fig. 19.

As noted before, the absolute value of v indicates the proportion of excess labor at hand which can be eliminated. Therefore, it can be said that the larger $|v|$ corresponds to smoother employment adjustment, namely, the larger $|v|$ is the smaller the cost of adjustment.

Fig. 19 shows that the $|v|$ s of Japanese manufacturing industries are distributed from 0.04 to 0.15 through the 1970's. Roughly speaking, around 10 percent of the excess

4) For more detail in estimation method and data, see Seike (1982).

Fig. 19. The absolute Values of Parameter ($|v|$)
for Japanese Manufacturing Industries



1. Food and kindred products
2. Textile mill products
3. Lumber and wood products
4. Paper and allied products
5. Chemicals and allied products
6. Petroleum and coal products
7. Rubber and misc. plastic products
8. Leather and leather products
9. Stone, clay and glass products
10. Steel products
11. Nonferrous metal products
12. Fabricated metal products
13. Machinery, except electrical
14. Electric and electronic equipment
15. Transportation equipment
16. Instruments and related products

labor was eliminated in a one month adjustment period. In terms of the inter-industry distribution of $lv|s$, an interesting pattern can be seen. Those industries with larger $lv|s$ tend to be mostly light (labor-intensive) industries, and those with smaller $lv|s$ mostly heavy (capital-intensive) industries. Most machinery industries and the rubber industry tend to be between these two types. This pattern suggests that there may be some systematic relationship between employment adjustment cost and the types of industries.

III-4. Intertemporal and international comparison of employment adjustment

a) Comparison of pre- and post-oil crisis employment adjustment in Japanese manufacturing industries

In Fig. 20, I plotted the absolute value of parameter v of Japanese manufacturing industries for both pre- and post-oil crisis time periods. The vertical axis in Fig. 20 is the post-oil crisis $lv|$ and the horizontal axis in Fig. 20 is the pre-oil crisis $lv|$. Note that only those parameters which were estimated to be significantly negative both for the pre- and post-oil crisis period are shown in Fig. 20. As shown in Fig. 20 the $lv|s$ of all industries are below the 45° line. This means that for every industry shown in Fig. 20, the absolute value of parameter v is smaller for the post-oil crisis period.

The fact that $lv|$ in a certain industry is smaller after the oil crisis than before means that the cost of employment adjustment may be larger after the oil crisis even within the same industry. Therefore, the difference in cost of adjustment may not come from technological differences among different industries but from the difference in the phase of the estimation period.

As shown in Figures 3 to 18, most Japanese manufacturing industries kept people to maintain at least the employment level before the oil crisis, but tried to reduce their workforce after the first oil crisis. Thus, we can regard the pre-oil crisis period as a positive employment adjustment phase, and the post-oil crisis period as a negative employment adjustment phase. This means that the relatively higher cost of adjustment corresponds to the phase of negative adjustment, and the relatively lower cost of adjustment corresponds to the phase of positive adjustment. In other words, employment adjustment cost are higher in reducing a workforce than in increasing it.

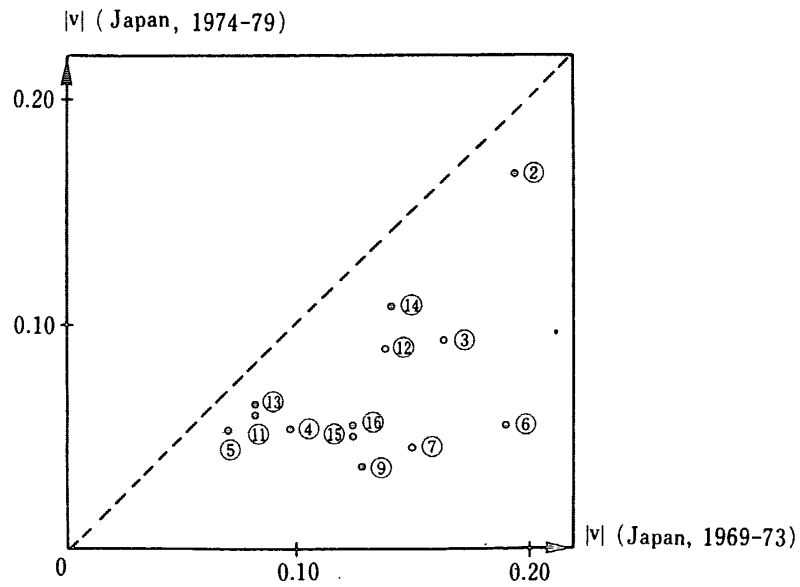
b) Comparison of employment adjustment between Japanese and US manufacturing industries

In order to observe the effect of Japanese employment practices on employment adjustment, it is convenient to compare the case of Japanese employment adjustment to that of other countries which have different employment practices. Here, I make a comparison between the Japanese case and the case of the US by using ELM.⁵⁾

Figures 21 and 22 show the absolute values of v for Japanese and US manufacturing industries for the periods 1969 to 1979 and 1974 to 1979, respectively. In both figures, the vertical axes represent $lv|s$ of Japanese industries, and horizontal axes represent those of the US. In Figures 21 and 22 I plotted only those industries in which a significantly negative parameter of v was obtained both for Japan and the US. Unfortunately,

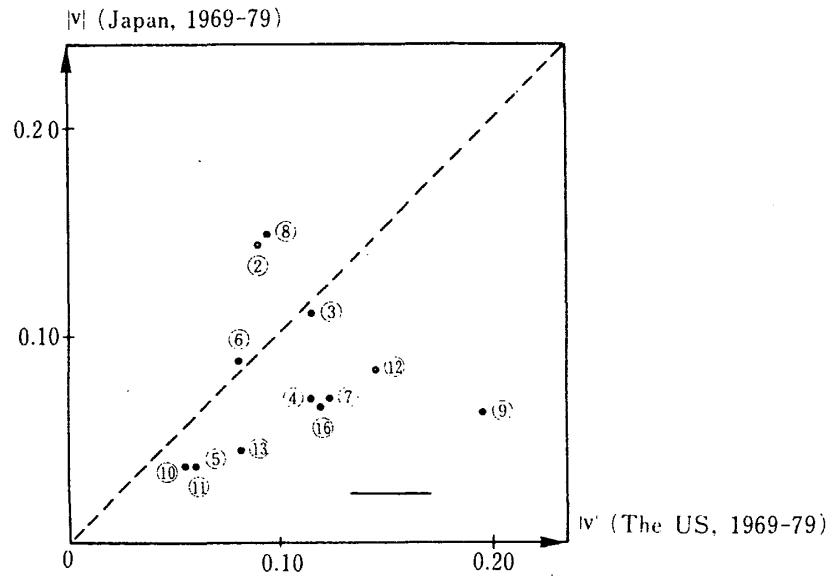
5) Data sources for US manufacturing industries are shown in footnote of Fig. 21.

Fig. 20. The Comparison of $|v|$ for the Pre-Oil Crisis Period and the Post-Oil Crisis Period in Japanese Manufacturing Industries



1. Food and kindred products
2. Textile mill products
3. Lumber and wood products
4. Paper and allied products
5. Chemicals and allied products
6. Petroleum and coal products
7. Rubber and misc. plastic products
8. Leather and leather products
9. Stone, clay and glass products
10. Steel industries
11. Nonferrous metal industries
12. Fabricated metal products
13. Machinery, except electrical
14. Electric and electronic equipment
15. Transportation equipment
16. Instruments and related products

Fig. 21. Comparison of $|v|$ between Japanese and US Manufacturing Industries* (1969 to 1979)



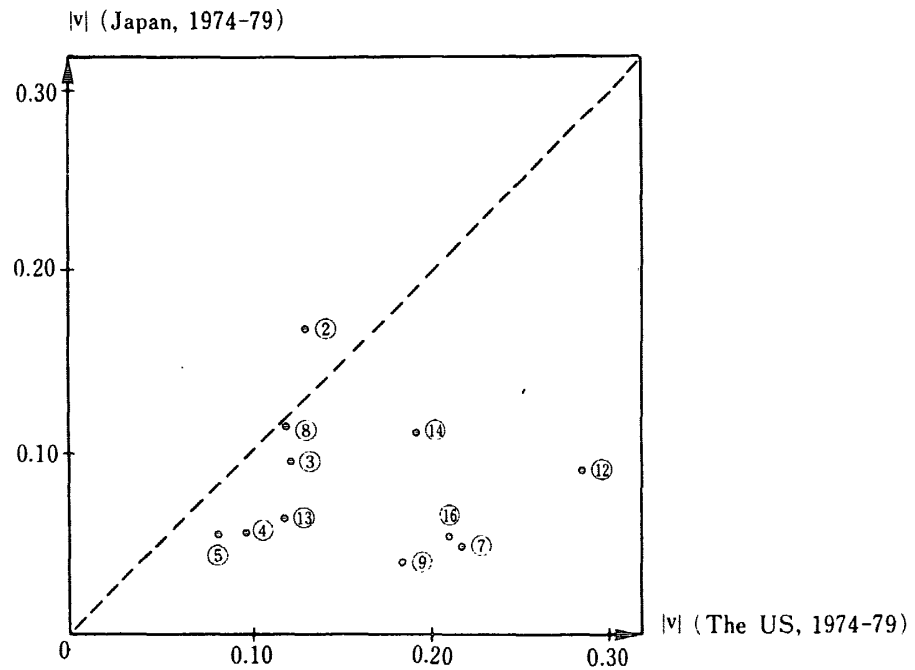
1. Food and kindred products**
2. Textile mill products
3. Lumber and wood products
4. Paper and allied products
5. Chemicals and allied products
6. Petroleum and coal products
7. Rubber and misc. plastic products
8. Leather and leather products
9. Stone, clay and glass products
10. Steel products***
11. Nonferrous metal products
12. Fabricated metal products
13. Machinery, except electrical
14. Electric and electronic equipment
15. Transportation equipment
16. Instruments and related products

* Data sources for estimating ELM of US manufacturing industries are *Employment and Earnings* by B.L.S. for employment and hours of worked and *Industrial Production* by F.R.B. for production.

** Tobacco is not included in the US but in Japan

*** In the US, steel and nonferrous metal industries are not separated but are placed together as 10-11 Primary metal industries

Fig. 22. Comparison of $|v|$ between Japanese and US Manufacturing Industries (1974 to 1979)



1. Food and kindred products*
2. Textile mill products
3. Lumber and wood products
4. Paper and allied products
5. Chemicals and allied products
6. Petroleum and coal products
7. Rubber and misc. plastic products
8. Leather and leather products
9. Stone, clay and glass products
10. Steel industries**
11. Nonferrous metal industries**
12. Fabricated metal products
13. Machinery, except electrical
14. Electric and electronic equipment
15. Transportation equipment
16. Instruments and related products

* Tobacco is not included in the US but is in Japan

** In the US, steel and nonferrous metal industries are not separated but are together as 10-11 Primary metal industries

among the US manufacturing industries in the pre-oil crisis period, there were not enough industries with significantly negative v 's to enable a comparison of these two countries during this period.

Since the vertical axes in Figures 21 and 22 represent lv 's of Japanese manufacturing industries and horizontal axes represent those of the US, the industries which were plotted below the 45° line show that the lv 's of these industries are smaller in Japan than in the US. Fig. 21 suggests that in most manufacturing industries (except #2 Textile mill, #3 Petroleum and coal and #8 Leather products) lv 's of Japan are smaller than those of the US through the 1970's (1969 to 1979). For the post-oil crisis period (1974 to 1979), as Fig. 22 shows, all manufacturing industries have smaller lv 's in Japan than in the US, with the exception of #2 Textile mill products. This means, for the same industries in the same period, the proportion of excess labor which was eliminated in one month was smaller in Japanese manufacturing industries than in their US counterparts. This suggests that employment adjustment was more costly in Japanese industries.

If the cost of employment adjustment was higher in Japan than in the US even when one controls for the type of industry and the estimation period, the difference in the adjustment cost might be mainly due to the institutional differences in the labor markets in the two countries. Probably one of the most important factors is the lack of a lay-off system in Japan, which seems to increase the cost of employment adjustment for firms. This is consistent with the fact that the lv 's in Japanese manufacturing industries were much smaller after the oil crisis when employment in manufacturing industries in both countries was reduced.

IV. The Employment Adjustment Measures

In this section, a brief review of measures conducted by the Japanese government in connection with the problems of employment adjustment due to the recession following the first oil crisis is presented. First, let us look at the organization of measures concerning employment adjustment. Then, the performance of these measures will be reviewed and discussed.

IV-1. The organization of measures concerning employment adjustment

During the employment adjustment period in the wake of the first oil crisis, the Japanese government provided various kinds of measures to minimize frictions arising from such adjustment, the most typical form of which is unemployment.⁶⁾

Although these measures take many forms they can be divided largely into two categories: measures that encourage employers to keep their idle workers within their firms in the case of business fluctuations, and measures that attempt to provide adequate assistance for job leavers from structurally depressed industries.

The most typical measure of the former type is the Employment Adjustment Subsidy (hereafter denoted as EAS) which was put into effect in 1975. Under this measure,

6) The chronology of employment adjustment measures in this period is shown in Appendix B.

eligible employers who are experiencing a depression are entitled to receive subsidies equal to half (for large firms over 300 employees) or two-thirds (for medium and small firms less than 300 employees) of the wages paid to idle workers who are participating in intrafirm training programs or who are on temporary leave. The source of this subsidy is the Employment Stabilization Fund which has accumulated through the contributions of employers (0.35 percent of the wages).

The Employment Creation Subsidy for Middle and Old Age Workers (hereafter denoted as ECS-MO) is another subsidy which is also financed from the Employment Stabilization Fund. The purpose of this subsidy is to maintain job opportunities for middle and old age workers who are usually forced to leave first when employment reduction becomes necessary. This was put into effect in 1977, and under this measure, eligible employers are entitled to receive subsidies equal to half (for large firms) or two-thirds (for medium and small firms) of the wages paid to middle and old age idle workers.

As illustrated in Appendix C, these two subsidies, the EAS and the ECS-MO, are included in the employment stabilization program under the umbrella of the Employment Insurance System which was made much more comprehensive in 1975. On the other hand, faced with the deterioration of the employment situation, the Japanese government also developed ad-hoc measures in connection with employment adjustment issues particularly for the structurally depressed industries and areas.

The Ad-hoc measure for Job Leavers in Selected Depressed Industries (hereafter denoted as AMJL-DI) enacted in 1977 provides special aids for eligible job leavers from selected structurally depressed industries such as subsidies for job search and retraining activities, an additional 90 days of unemployment benefits for middle and old age job leavers, and special counselling and guidance for them to find adequate alternative job opportunities. The Ad-hoc Measure for Job Leavers in Selected Depressed Areas (hereafter denoted as AMJL-DA) was developed for the same purposes as the AMJL-DI and enacted in 1978. As comprehensive measures, both the AMJL-DI and the AMJL-DA also provide subsidies entitled the Employment Creation Subsidy for Designated Structurally Depressed Industries (hereafter denoted as ECS-DI) and the Employment Creation Subsidy for Designated Depressed Areas (hereafter denoted as ECS-DA) for eligible employers to recruit job leavers as regular employees from either designated structurally depressed industries or areas.

The noteworthy point of these ad-hoc measures is that they were enacted in close connection with industrial policy. For this reason, these measures can be applied only to those who already have been affected by industrial policies of the government such as those firms covered by the business conversion promotion program.

IV-2. The performance and evaluation of employment adjustment measures

Tables 1 and 2 show the performance of the major subsidies described above. The size of budget-expenditures of these subsidies are shown in Table 1, and the number of recipient workers in Table 2.

Looking over Tables 1 and 2, we at first realize that the EAS was utilized much more compared to other subsidies. The EAS was extensively used especially in the phase of the

Table 1. Performance of Major Employment Subsidies in budget and expenditure (1975-1980)

	EAS		ECS-MO	ECS-DI	ECS-DA
1975	Bd.	14,240			
	Ex.	55,220			
1976	Bd.	38,910			
	Ex.	5,430			
1977	Bd.	37,590	160		
	Ex.	3,290	20		
1978	Bd.	53,580	2,990		
	Ex.	6,800	4,800		
1979	Bd.	22,940	35,890	2,220	490
	Ex.	2,430	16,920	270	60
1980	Bd.	6,140	66,330	580	70
	Ex.	2,750	84,040	230	150
1981	Bd.	2,680	104,790		
	Ex.	9,330	106,480		
1982	Bd.	8,210	34,360		
	Ex.	9,890	38,500		

Budgets (Bd.) and Expenditures (Ex.) (in million yen)

Source: Data compiled by the Employment Policy Division, the Ministry of Labor

Note: EAS; The Employment Adjustment Subsidy
 ECS-MO; The Employment Creation Subsidy for Middle and Old Age Workers
 ECS-DI; The Employment Creation Subsidy for Designated Depressed Industry
 ECS-DA; The Employment Creation Subsidy for Designated Depressed Area

Table 2. Performance of Major Employment Subsidies in number of recipient (1975-1982)

	Recipient Workers and Establishment				
	EAS		ECS-MO	ECS-DI	ECS-DA
	Establishments (100)	Man-days (1,000)	100 Persons	100 Persons	100 Persons
1975	594	23,990			
1976	41	2,010			
1977	20	1,290	31		
1978	37	2,050	344	7	
1979	21	560	857	7	5
1980	40	830	1,088	6	10
1981	133	2,664			
1982	133	2,554			

Source: Data compiled by the Employment Policy Division, the Ministry of Labor

Note: EAS; The Employment Adjustment Subsidy
 ECS-MO; The Employment Creation Subsidy for Middle and Old Age Workers
 ECS-DI; The Employment Creation Subsidy for Designated Depressed Industry
 ECS-DA; The Employment Creation Subsidy for Designated Depressed Area

deepest recession following the first oil crisis. However, the focus of budget-expenditure and number of recipient workers covered was shifted from the EAS to the ECS-MO in 1979. On the other hand, the ECS-DI and the ECS-DA have not been utilized so much as the EAS and the ECS-MO.

The primary reason why the EAS was used so extensively in the employment adjustment period in the wake of the first oil crisis may lie in the fact that it attempted to encourage employers to keep their employees within firms. Since the cost of employment adjustment in terms of the number of men is relatively high for Japanese manufacturing firms, especially in the phase of employment reduction as was seen in the section III, firms tend to reduce their work force very gradually. Because of this, in the process of employment adjustment, they rely heavily on such measures as cutting overtime work, intrafirm transfer of workers, reduced hiring of new recruits, and attrition of employment. In fact, many firms that suffered hard recessions succeeded in avoiding lay-offs or dismissals of their employees. Some firms tried to diversify or convert their business activities, maintaining idle workers within their firms or initiating various kinds of intrafirm retraining programs. Considering these facts, it seems that the EAS, especially its training subsidies, conforms to the nature of employment adjustment in Japanese manufacturing firms and was fairly effective in minimizing unemployment from firms suffering recessions.⁷⁾

The shift of subsidies from the EAS to the ECS-MO in the end of the 1970s suggests, on the one hand, the weakening of the overall employment problem after the first oil crisis, and, on the other hand, the growing of the particular employment problem of the aged caused by the rapidly aging of population in Japan. Recent extensive use of ECS-MO also reflects the fact that it has provided much more favorable benefits during the period between April 1979 and July 1981 than previously. Under this special treatment, eligible employers were entitled to receive subsidies equal to three-fifths (for large firms) or four-fifths (for medium and small) of the wages paid to the targeted middle and old age workers.

There are several reasons why the ECS-DI and the ECS-DA, which were provided by ad-hoc measures for structurally depressed industries, were not utilized as much as the EAS or the ECS-MO. Institutionally, as noted earlier, there is the restriction that eligible workers for these subsidies must be affected by the associated industrial policies. This institutional restriction in some extent prevents these ad-hoc measures from working flexibly according to changes in conditions of the labor market. It may also be attributed to the fact that most of the eligible workers or employers for these subsidies had already received subsidies from other measures like the EAS or the ECS-MO. Japanese firms tend to maintain their workforce on the payroll even in deep recessions. In other words, the Japanese labour market has a highly internalized structure. Thus, employment measures like the EAS which are designed to help firms maintain their workforce work more effectively in Japan.

7) For more detail in fact-findings for employment adjustment practice in Japanese firms, see the chapter 3 of Shimada-Orr-Seike (1982).

References

Fair, Ray, C. (1969)

The Short-Run Demand for Workers and Hours, New York, London, Amsterdam; North-Holland, 1969.

Seike, Atsushi (1982)

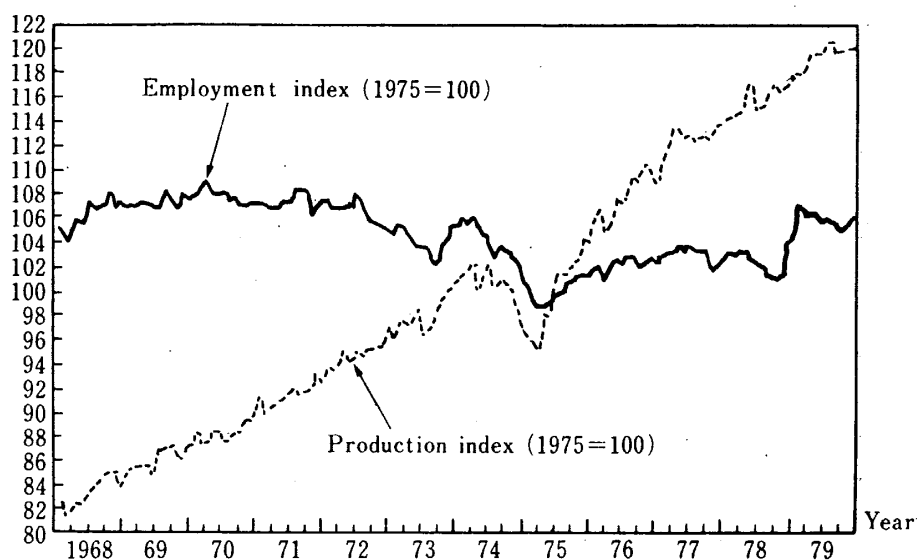
"Seizogyo Kigyo ni Yoru Koyo-Chosei no Seikaku ni Kansuru Hikaku-Bunseki," *Mita Shogaku Kenkyu* Vol. 25, No. 5, December 1982. ("Aspects of Employment Adjustment in Japanese and US Manufacturing Industries," *Mita Business Review*, Vol. 25, No. 5, December 1982.

Shimada, Haruo, Orr, Japmes and Seike, Atsushi (1982)

U.S.-Japan Comparative Study of Employment Adjustment, a final report of the U.S. Department of Labor-Japan Ministry of Labor comparative research project on employment adjustment, 1981-82.

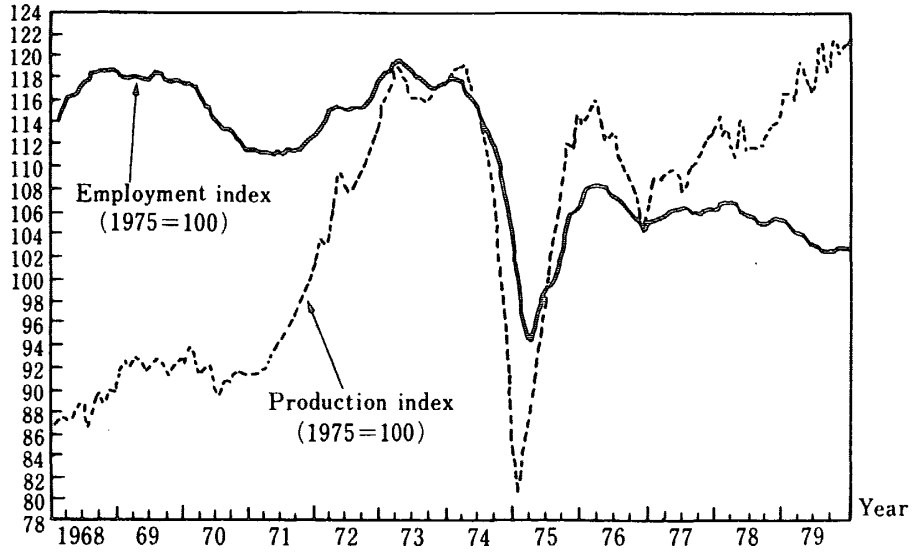
Appendix A (Fig. 23-37)

Fig. 23. Fluctuations in Employment and Production
1. Food and kindred products (US)



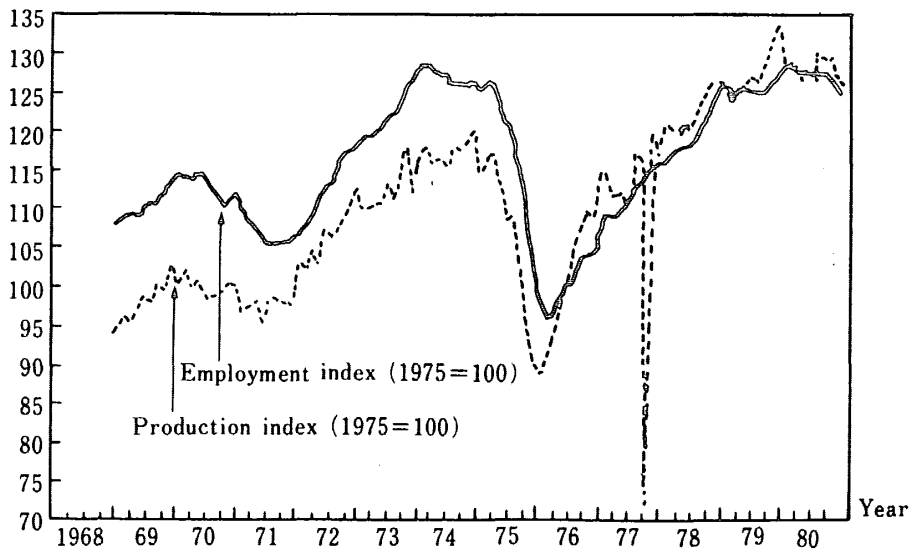
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 24. Fluctuations in Employment and Production
2. Textile mill products (US)



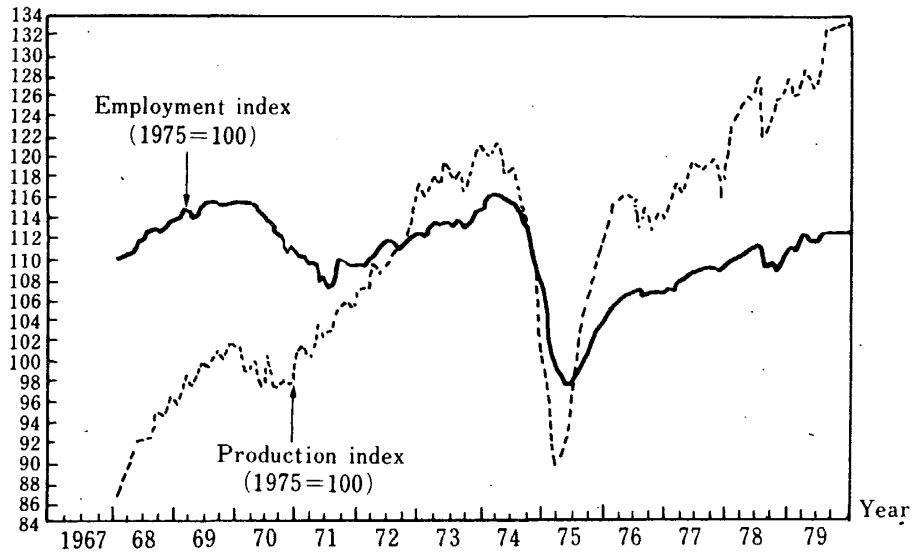
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board.

Fig. 25. Fluctuations in Employment and Production
3. Lumber and wood products (US)



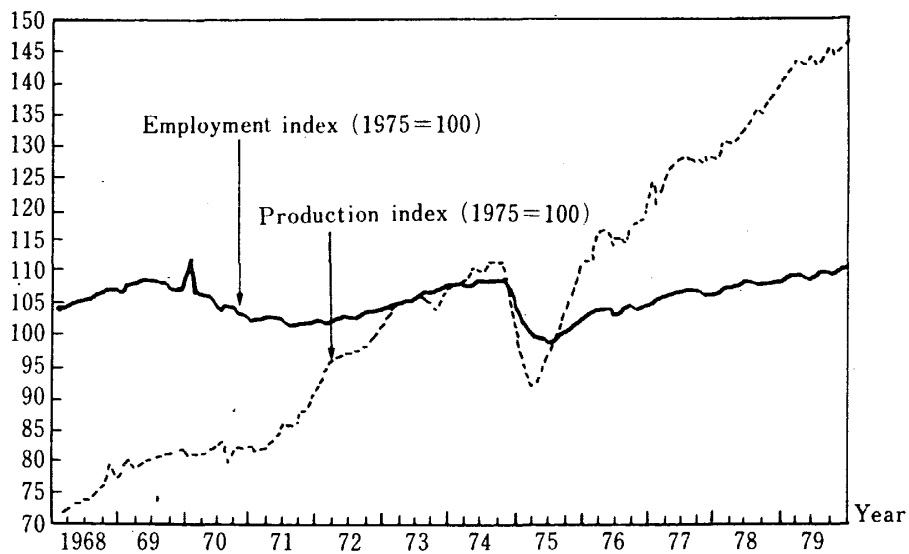
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 26. Fluctuations in Employment and Production
4. Paper and allied products (US)



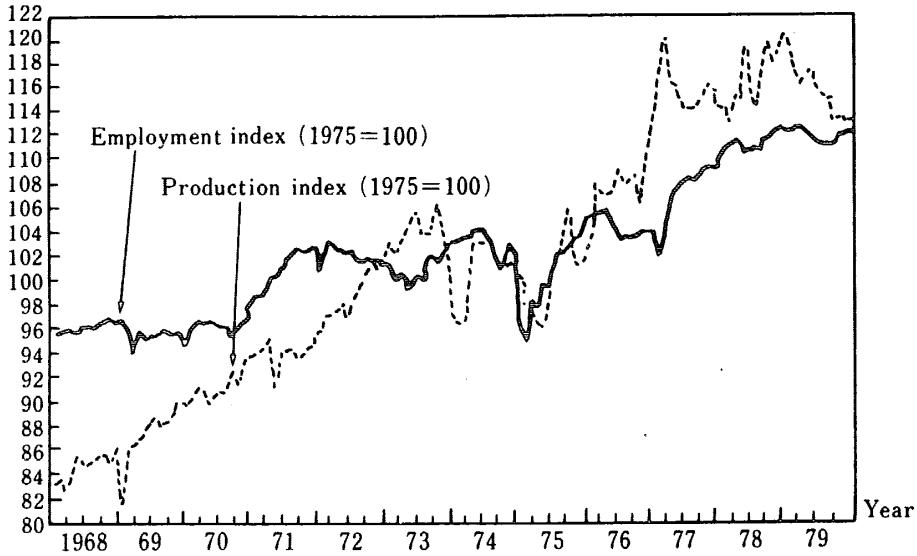
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 27. Fluctuations in Employment and Production
5. Chemicals and allied products (US)



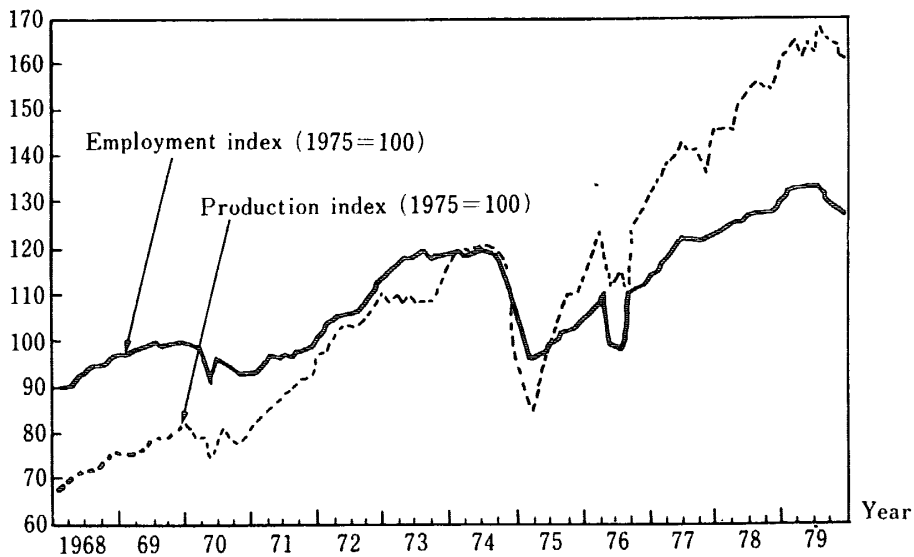
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. federal Reserve board.

Fig. 28. Fluctuations in Employment and Production
6. Petroleum and coal products (US)



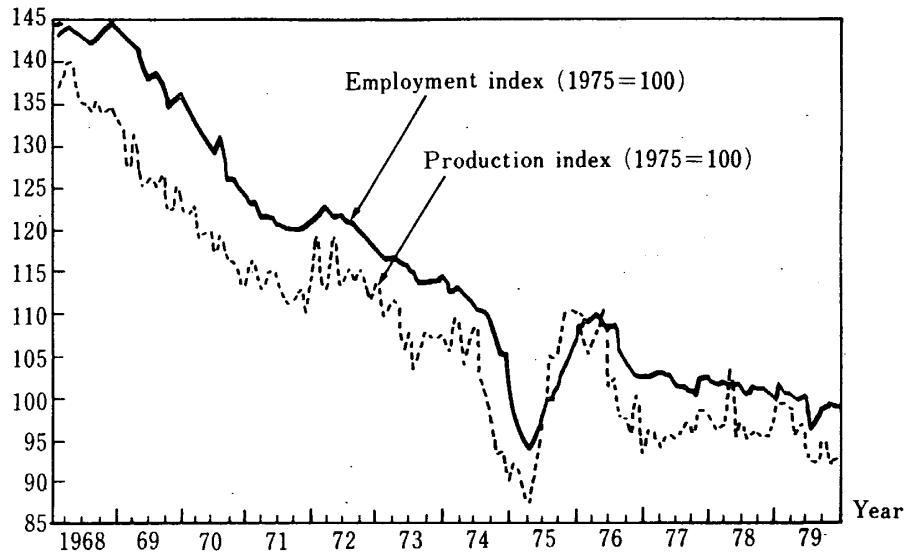
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 29. Fluctuations in Employment and Production
7. Rubber and misc. plastic products (US)



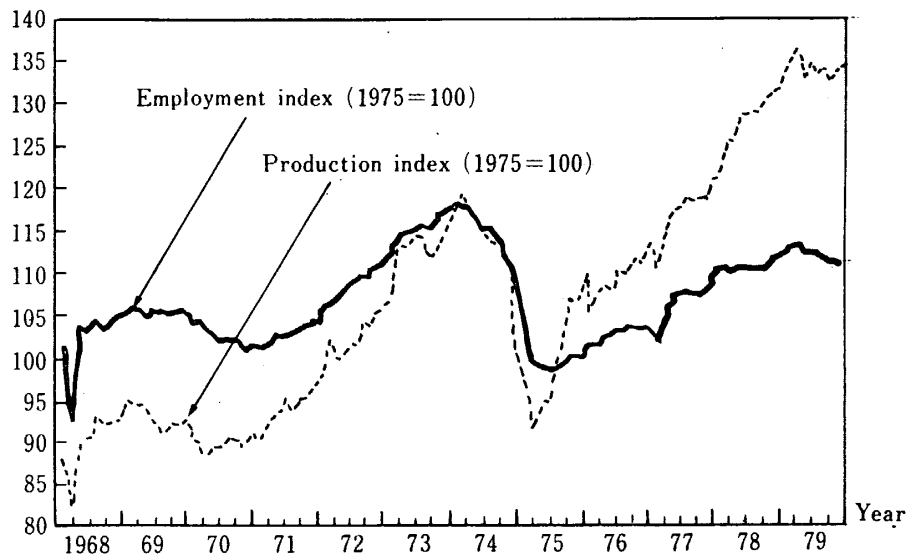
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 30. Fluctuations in Employment and Production
8. Leather and leather products (US)



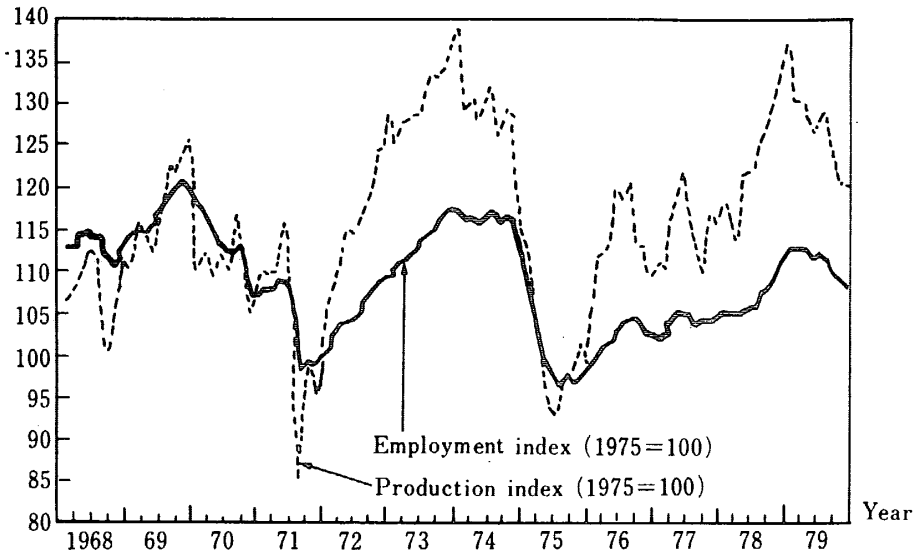
Source: Employment index (solid line) —
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 31. Fluctuations in Employment and Production
9. Stone, clay and glass products (US)



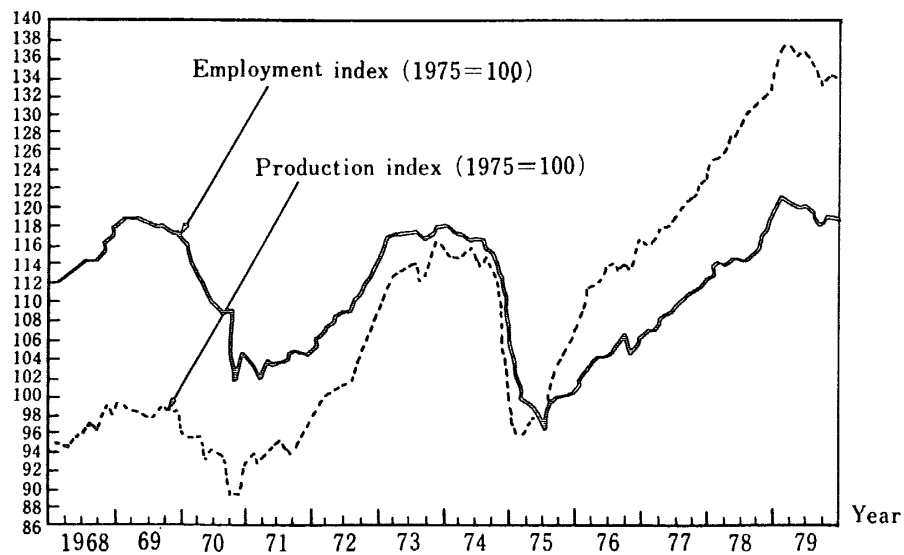
Source: Employment index (solid line) —
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 32. Fluctuations in Employment and Production
 10. Primary Metal (US)



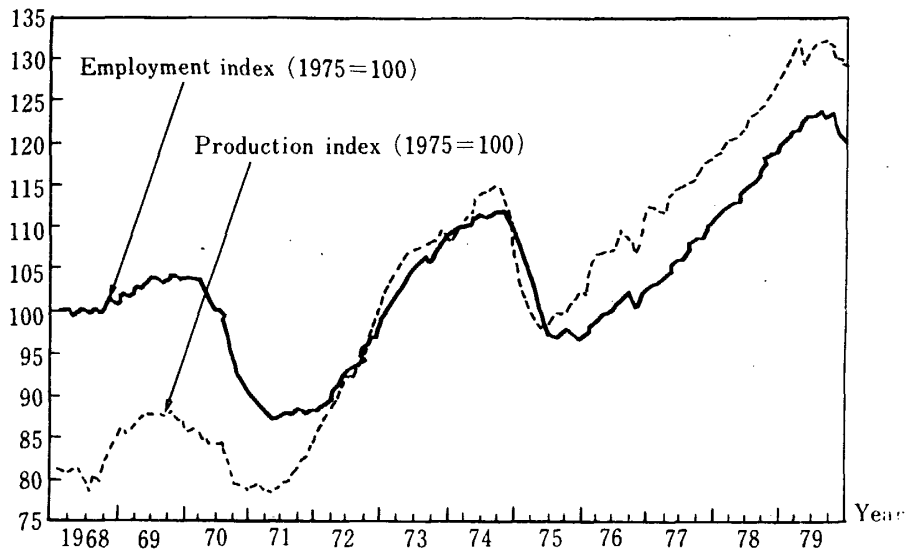
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 33. Fluctuations in Employment and Production
 12. Fabricated metal products (US)



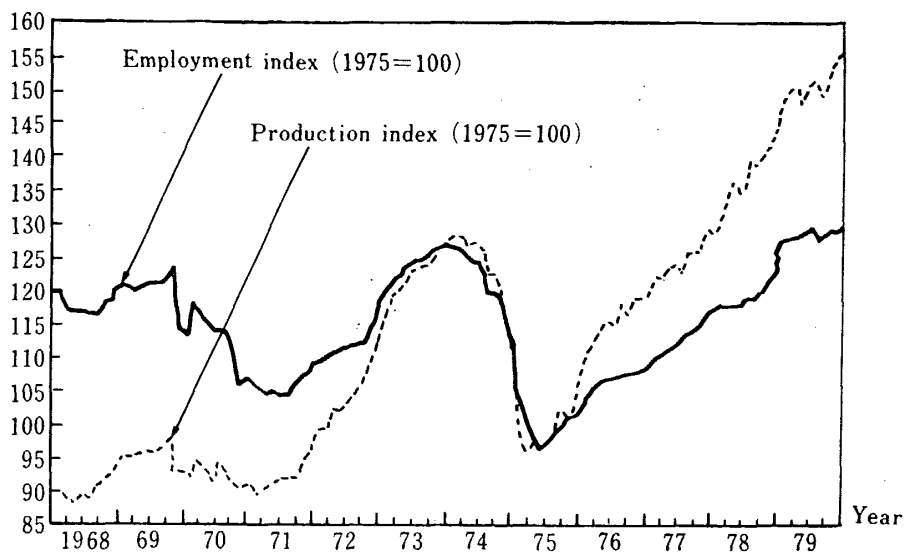
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 34. Fluctuations in Employment and Production
13. Machinery, except electrical (US)



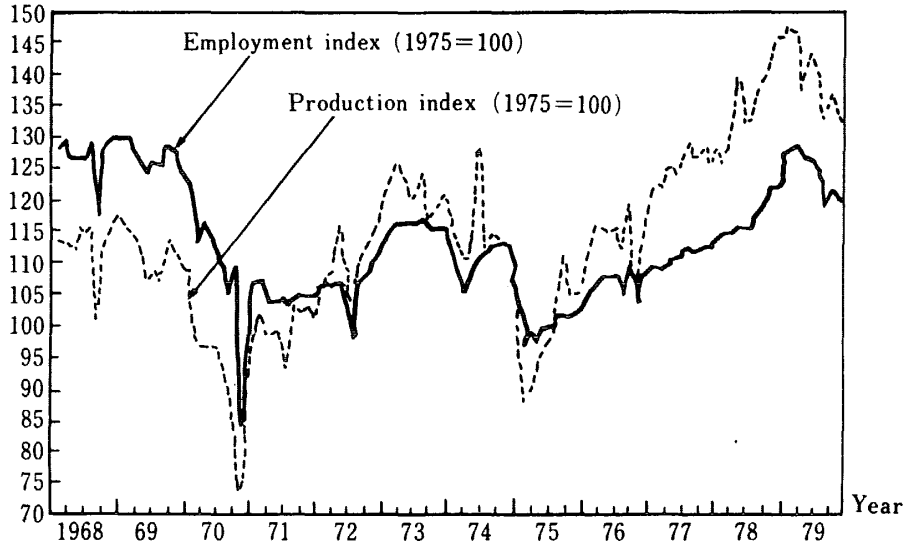
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 35. Fluctuations in Employment and Production
14. Electric and electronic equipment (US)



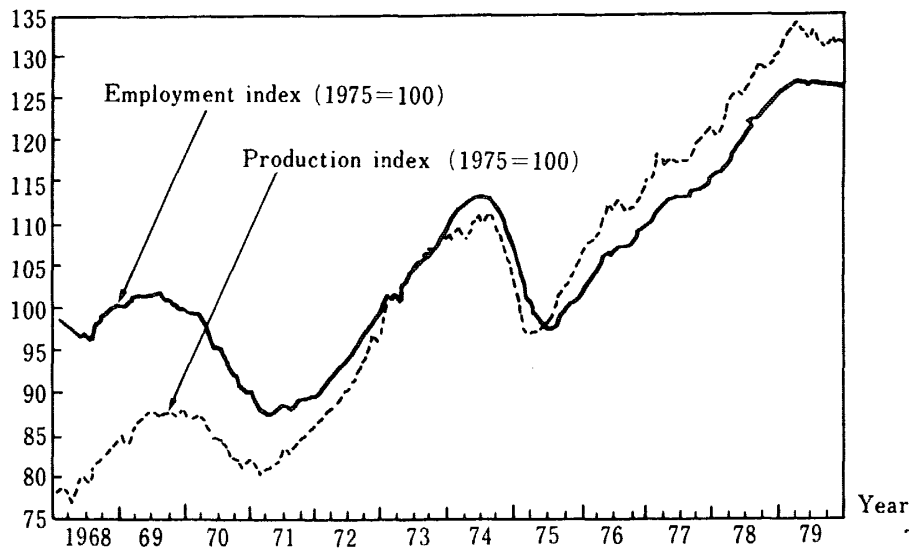
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 36. Fluctuations in Employment and Production
 15. Transportation equipment (US)



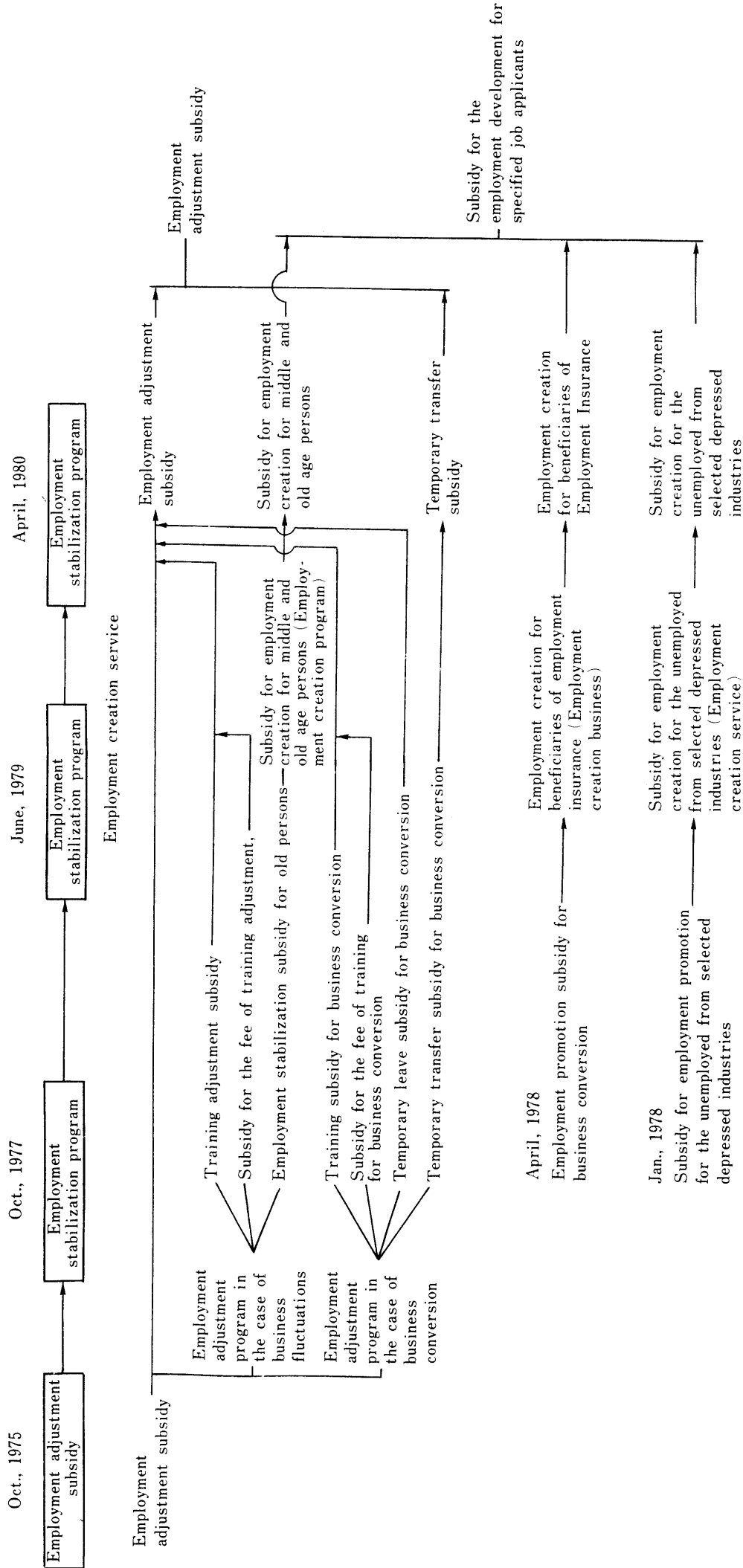
Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Fig. 37. Fluctuations in Employment and Production
 16. Instruments and related products (US)



Source: Employment index (solid line) ———
Employment and Earnings: The U.S. Department of Labor
 Production index (dotted line) - - - - -
Industrial Production: The U.S. Federal Reserve Board

Appendix B Chronological Reforms of Employment Adjustment Subsidies



Appendix C The System of Employment Insurance

