

**“Voice” and “exit” in Japanese firms during the Second World War:
Sanpo revisited¹**

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1. Introduction

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Abstract

During the Second World War, the Japanese government and private sector searched for and implemented new mechanisms for coordination and new incentives. One of these was *sangyo hokokukai* or *sanpo*. *Sanpo* unit was essentially an organization of the employer and employees of each firm, which held employees meetings to moderate labor relations. In this paper, I examined the role of *sanpo*, using prefectural data and firm level data, based on a framework integrating the “voice view” of unionism and the transaction cost economics. According to the analysis of prefectural data, *sanpo* reduced the level of participation in labor disputes until around 1941, and enhanced labor productivity until 1942. Estimating production function by monthly firm level data from the cotton spinning industry, we found that *sanpo* increased TFP by 3.1%. Also, from the annual establishment level data from the coal mining industry, we can confirm that *sanpo* enhanced labor productivity.

The Second World War had a tremendous impact on the Japanese economy and a vast amount of resources were mobilized for the war effort. In managing the war economy under a rapidly deteriorating environment, the Japanese government and private sector searched for and implemented new mechanisms for coordination and new incentives. These included controlling associations (*toseikai*) that acted as intermediaries to pass information back and forth between the government and firms, decentralization of decision-making, manipulation of production incentives using price controls, intervention in the corporate governance structure, and mediation of syndicate loans by The National Financial Control Association².

In addition to these measures, which basically addressed the upper layers of the economic system, a new innovation was introduced at the shop floor level. This new innovation was called *sangyo hokokukai* or *sanpo*. *Sanpo* itself was a three-layered organization. At the bottom, there was a *sanpo* unit at each establishment or each firm. The *sanpo* units were organized into regional associations, which, in turn, were under the *Dai Nihon Sangyo Hokokukai*, the national center of the *sanpo* movement, which was controlled by the government. Here, we focus on the *sanpo* unit. The *sanpo* unit played various roles, including holding employees meeting, recreation, and rationing of food and clothes.

The *sanpo* system has long been the subject of research in Japan since the early postwar period. Kazuo Okochi, who led the field of labor research in postwar Japan, proposed several remarkable interpretations of *sanpo*. First, in a book published in 1955, he gave a negative assessment of *sanpo*: “*Sangyo hokokukai* formerly dominated the whole country, but it proved to be ineffective as an organizational basis for the war economy in the long run.”³ On the other hand, in another article in 1971, he argued, “It was appropriate to attach importance to workers organizations and to have issues including employment conditions discussed at employee meetings, to improve communication between employers and employees, to increase work incentives and to enhance productivity.” This evaluation corresponds to the view that employee meetings continued to be the core of the *sanpo* organization throughout the war period. Also, he gave *sanpo* the credit for maintaining order on the shop floor during the final stages of the war, and wrote, “(the role of *sanpo*) was related to the sudden emergence of company unions after the war.” Okochi’s second view is remarkable, in that it can be regarded as a forerunner of “voice view” on the role of labor unions.

The “voice view” of unionism refers here to the view proposed by C. Brown, R. Freeman and J. Medoff that a labor union enhances productivity through making the collective voice of workers

² T. Okazaki and M. Okuno-Fujiwara, “Japan’s Present-Day Economic System and Its Historical Origins,” in T. Okazaki and M. Okuno-Fujiwara eds. *The Japanese Economic System and Its Historical Origins*, New York, Oxford University Press, 1999

³ K. Okochi, *Sengo Nihon no Rodo Undo*, (*Labor Movement in Postwar Japan*), Tokyo, Iwanami Shinsho

effective⁴. First, if the voice of workers is listened to, this reduces the turnover of workers as complaints are resolved, thereby saving on training costs and promoting the formation of firm-specific skills. Second, it promotes participation and work incentives for workers through sharing information with the employer. Third, it enables workers to transmit local information on the shop floor and their preferences to their employer frankly.

As progressive it was, Okochi's second view has not subsequently been adopted by later research on *sanpo*. Andrew Gordon, in his influential book, claimed that employee meetings under the *sanpo* system failed to achieve either harmony between employer and employees or equalization among employees, which was pursued during the Sino-Japanese War, and it also failed to enhance work incentives, rate of attendance or productivity, which was pursued during the Pacific War⁵. Yutaka Nishinarita argues that as *sanpo* could not successfully consolidate workers in the period from 1938 to 1940, it was reorganized into an organization emulating the army, but it damaged the function that mediated labor relations, contrary to the intention of the government⁶. Kazuro Saguchi also gives a negative evaluation of the actual function of *sanpo*, though he ranks it highly in ideological terms⁷.

In this paper, a reconsideration of the role of *sanpo* in line with Okochi's second assessment, from the standpoint of voice view, will be undertaken. In applying voice view to wartime Japan, the insights provided by transaction cost economics will be incorporated. Oliver Williamson wrote a remarkable comment on the voice view in his book: "Whereas the voice view of unionism attributes beneficial governance features to union organization quite generally, the transaction (or governance) approach predicts that they will vary with the continuity needs of the parties," and "those continuity needs are greatest where human assets are more highly specific."⁸ Interestingly, as discussed in section 2 of this paper, in late 1930s Japan, while the government promoted *sanpo*, it implemented two other labor policies at the same time, namely restricting inter-firm labor transfers and obliging each firm to train workers. These policies imply the imposition of a restriction on the "exit" option of

⁴ C. Brown and J. Medoff, "Trade Union in the Production Process," *Journal of Political Economy*, vol.86; C. Freeman and J. Medoff, *What do Unions Do ?*, Basic Books, 1984; J. E. Lazear, *Personal Economics for Managers*, John Wiley & Sons, 1998; Baron and D. Kreps, *Strategic Human Resource Management*, John Wiley & Sons, 1999

⁵ A. Gordon, *Evolution of Labor Relation in Japan*, Harvard East Asian Monograph, 1988

⁶ Y. Nishinarita, *Kindai Nihon Roshi Kankeishi no Kenkyu* (Research on the History of Labor Relation in Modern Japan), Tokyo, The University of Tokyo Press

⁷ K. Saguchi, *Nihon ni okeru Sangyo Minshushugi no Zentei: Roshi Kondan Seido kara Sangyo Hokokukai he* (Precondition of Industrial Democracy in Japan: From Factory Committee to Sanpo), Tokyo, The University of Tokyo Press. One exception is Sakiko Shioda, "Sangyo Hokoku Undo no Jittai to Kino," (The Reality and Function of Sanpo Movement," in Shakai Seisaku Gakkai ed., *Gendai Nihon no Chingin Mondai* (Wage Issues in Contemporary Japan), Tokyo, Ochanomizu Shobo, 1982), which pointed out that *sanpo* was effective in preventing labor disputes, although it failed to induce workers to cooperate to increase production and control labor. The view of Makoto Sakurabayashi, *Sangyo Hokokukai no Soshiki to Kino* (Organization and Function of Sanpo), Tokyo, Ochanomizu Shobo, 1985) concerning the function of *sanpo*, is not clear except in the final stage of the war.

⁸ O. Williamson, *The Economic Institutions of Capitalism*, New York, Free Press, 1985, p.257.

workers, and the formation of firm-specific skills. Therefore, according to the voice view and by integrating the insight of transaction economics, we can predict that the role of the collective voice of workers became more significant due to these policies. And we can form the hypothesis that the voice mechanism was adopted and advanced by the *sanpo* system. This hypothesis will be examined using quantitative data as well as historical documents.

2. Wartime labor control and its consequences

Japan entered into a war with China in July 1937, when the Japanese economy was already close to full employment as a result of around four years of expansion. The war stimulated the economy further, which in turn brought about a large increase in the demand for labor. Employment in the manufacturing sector, which had been 1.66 million in 1931 and 2.56 million in 1936, rose to 3.84 million in 1940. The increase in employment numbers was especially sharp in the machinery industry, which was closely related to munitions. It increased from 0.46 million to 1.28 million between 1936 and 1940, an increase of 29.3% per year (Figure 1).

This sharp increase in the demand for labor brought about serious problems in the labor market and in labor relations. First, a substantial shortage of skilled worker emerged, which caused active poaching of skilled workers by firms. Second, as a sudden rise in inflation occurred and increases in the nominal wage lagged behind, there was accelerating labor unrest over demands for wage increases. There was a marked increase in large-scale disputes in particular, and the number of workers involved in disputes was 2.3 times greater in 1937 than it had been in the previous year (Figure 2).

Meanwhile, as part of its preparations for a prolonged war, the government was drawing up a long-term plan for production capacity expansion. The government regarded the shortage of skilled workers as a serious problem, and took two measures, namely promotion of worker training and regulation of inter-firm labor transfers. With respect to training, the government established three national training centers, and provided subsidies to regional and private training centers. The annual objective was to train 750 skilled workers at the national training centers and 1000 at the regional and private centers⁹. However skilled workers were still in short supply. In 1939, based on the National Mobilization Law, the Factory and Establishment Skilled Workers Training Act was passed. Under the Act, the government had the authority to order a private establishment with more than 200 male employees older than 16 years, to train a certain number of employees as skilled workers. To begin with, private companies operating in 22 industries including mining, metal, machinery etc. were designated to train workers¹⁰.

Two points concerning this training policy should be mentioned. First, whereas at first the

⁹ Asahi Shinbunsha, *Asahi Keizai Nenshi*, (*Asahi Economic Year Book*) 1938, p.496

¹⁰ M.Sumiya ed. *Nihon Shokugyo Kunren Hatten Shi (History of Vocational Education in Japan)* vol.2, Tokyo, Nihon Rodo Kyokai, pp.295-297.

government had determined that training centers would operate outside the firm, it changed its policy to allow training inside the firm. Second, the Factory and Establishment Skilled Workers Training Act set down clearly the attributes the skilled workers were expected to acquire. That is, “skilled workers should have wide ranging technical expertise in the production area of the establishment they work at, and should be able to perform their work correctly without supervision from a superior,” and “they should not be so called specialized workers who have skills only within a very limited area.”¹¹ Even before the Sino-Japanese War, discussions were held among policy makers and researchers on the types of skilled workers that should be produced through such a training program, namely, general skilled workers or specialized skilled workers. The Act clearly indicated a preference for training general skilled workers. Also, it is remarkable that this concept of the skilled worker closely resembles the worker with “intellectual skill” in the contemporary Japanese manufacturing industries¹². Summing up these two points, we can say that during the war, the government aimed at creating workers with general and intellectual skills inside the firm.

The regulations covering inter-firm labor transfers, the other policy measure introduced to address the shortage of skilled workers, will now be described. In 1939, at the same time the Factory and Establishment Skilled Workers Training Act was introduced, the Employment Restriction Act was passed. This Act was also based on the National Mobilization Law. According to the Act, the employment of male workers aged 15 to 50 years, who had been employed by another employer for more than three months, including those who left that employer within six months, had to be approved by the chief of the public job introduction office¹³.

It should be noted that there was a reason why these two Acts were introduced at the same time in addition to their common purpose, namely, coping with the shortage of skilled workers. The workers who were restricted from transferring from one firm to another under the Employment Restriction Act included those who had been undergoing training according to the Factory and Establishment Skilled Workers Training Act for more than three months and those who had completed their training within six months. This was to prevent trainees from being poached by another firm¹⁴. The intention of the Act was to prevent a firm from taking unfair advantage of the training provided by another firm, and thereby created greater incentives for a firm to train its own workers. In this sense, the restriction placed on transferring from one company to another supported the training policy.

Meanwhile, labor disputes, which had become stabilized in 1938, flared up again in 1939 (Figure

¹¹ Kyochokai, *Senji Rodo Jijo (Wartime Labor Affairs)*, Tokyo, 1944

¹² K. Koike, *The Economics of Work in Japan*, Tokyo, LTCB International Library Foundation, 1991, pp.63-74; K.Koike, “Learning and Incentive Systems in Japanese Industry,” in M.Aoki and R.Dore eds. *The Japanese Firm: Sources of Competitive Strength*, New York Oxford University Press, 1993.

¹³ Asahi Shinbunsha, *Asahi Keizai Nenshi, (Asahi Economic Year Book)* 1939, pp.293-294.

¹⁴ S. Hirotsuki, *Nihon no Romu Kanri (Labor Management in Japan)*, Tokyo, Toyo Shokan, 1941, p.545

2)¹⁵. In a 1939 report, the Police Bureau of the Ministry of Domestic Affairs attributed the unrest to a decline in “the cooperative spirit under the emergency” of employers and employees due to the prolonged war, workers’ uneasiness about life due to economic controls and inflation, and the decline in incomes due to labor controls.¹⁶ In another report issued two years later, the Police Bureau documented the influence of labor controls in more in detail: “As labor controls have aimed at mobilizing the labor force and its appropriate allocation, these controls have basically focused on workers. Consequently, workers have felt pressures, and some of them complain of the partiality of the government policy, which in turn has substantially decreased worker morale and efficiency. Concerning the Workers Transfer Restriction Act and National Labor Certificate Law, many workers thought that these acts have pegged them at the work place. Therefore, while inter-firm labor transfers have been restricted, complaints from workers regarding labor conditions have been building up, and as a result, efficiency has declined due to explicit or implicit sabotage and a decrease in worker morale.”¹⁷

These observations by the Police Bureau are remarkable in relation to the framework discussed in section 1. They imply that as labor controls restricted the option of workers to exit from a firm, their complaints had been mounting inside the firm, which in turn caused labor disputes and a decline in efficiency. A researcher also reported on the Employment Restriction Act in 1940: “Prior to this, conflicts could dispersed out of the firm. However, the restrictions imposed on changing companies have confined the conflict to within the firm, which led to disputes and sabotage everywhere.”¹⁸ Another researcher pointed out “As a result of various restrictive acts, workers have been unable to choose what factories they work at.” Exacerbating the situation, wages were frozen, and as a result, “The general disposition of workers has worsened, which in turn has had a negative influence on production efficiency, and resulted in a mood conducive to acts of sabotage”¹⁹

3. Function of *sanpo* □: Descriptive evidence

The rise in the number of labor disputes in 1937 compelled the government to examine existing measures on labor relations, which resulted in the introduction of the *sanpo* system²⁰. The idea of

¹⁵ Showa Kenkyukai, *Rodo Shintaisei Kenkyu (Research on the New Labor System)*, Tokyo, Toyo Keizai Shinposha, 1941

¹⁶ The Police Bureau of the Ministry of Domestic Affairs, *Shakai Ubdo no Jokyo (State of Social Movement)*, 1940.

¹⁷ The Police Bureau of the Ministry of Domestic Affairs, *Shakai Ubdo no Jokyo (State of Social Movement)*, 1942.

¹⁸ S.Hirano, “Jikyoku ka Rodo Jijo no Rodo Seisaku ni Oyoboshita Eikyo,” (The Influence of Labor Conditions on Labor Policy,” *Shakai Seisaku Jiho (Periodical of Social Policy)*, 1940.

¹⁹ M.Nishi, “Rodo Sogi no Gaikan,” (An Overview of Labor Disputes), *Shakai Seisaku Jiho (Periodical of Social Policy)*, 1939.

²⁰ S.Ujihara and S.Hagiwara, “Sangyo Hokoku Undo no Haikei,” (Background of Sanpo Movement), Institute of Social Science, The University of Tokyo eds. *Fashizumuki no Kokka to Shakai, (States and*

sanpo originated in a document entitled “Emergency Measures for Moderating Labor Relationship,” drafted by the Police Department of Aichi Prefecture in October 1937. This document proposed the setting up of factory committees in which representatives of the employer and employees participated, in order to resolve and prevent labor disputes. On the other hand, employers were opposed to the policy promoting a factory committee, as this policy presupposed the existence of a conflict of interests between employers and employees. While there remained some ideological differences between the government and employers, many *sanpo* units were established owing to the policy of the Ministry of Domestic Affairs and the Ministry of Welfare, which promoted *sanpo*. The proportion of workers participating in *sanpo* (members of *sanpo*/total workers) exceeded 40% at the end of 1939, and reached 70% by the end of 1941 (Figure 3).

While the Ministry of Domestic Affairs and the Ministry of Welfare at first placed importance on the proper management of labor relations at *sanpo* meetings, from late 1939 they began to modify their official view. They announced an alternative official view that work was a national duty and *sanpo* meetings were a way of fulfilling that duty. As the document pointing to this change in policy, precedent literature has focused on “Outline of the *Sanpo* Movement,” issued by the Labor Bureau of the Ministry of Welfare (November 1939)²¹. It is true that the document clearly stated, “the discussions on labor conditions during the early stages of the *sanpo* movement were due to a misunderstanding of the essence of the *sanpo* meeting.” However, at the same time, the *sanpo* meeting itself was still strongly emphasized in this document. Also, it was still thought to be desirable for members to talk frankly about their experiences, research, original ideas, opinions and desires.

In November 1940, the *Dainihon Sangyo Hokokukai* was established as the national center of the *sanpo* movement, and was a part of the New Economic System in a broad sense.²² The policy of the *Dainihon Sangyo Hokokukai* on the *sanpo* unit conformed to the “Outline of the *Sanpo* Movement” mentioned above. In fact, a document by the *Dainihon Sangyo Hokokukai*, “The New Aims of the *Sanpo* Movement Facing the War” written in September 1941, has been frequently cited as evidence indicating the change in the nature of the *sanpo* system.²³ The major thrust of the document was to reorganize a *sanpo* unit into a hierarchical organization corresponding to the firm’s organization, emulating the army, and to make *sanpo* meetings a supplementary organ of authoritarian control. Makoto Sakurabayashi wrote that “Downgrading the meeting to a supplementary organ, this reform formally as well as actually abolished the *sanpo*’s function of managing or changing labor relations

Societies during the Fascism Period), vol.6, The University of Tokyo Press, 1974

²¹ F.Kanda, *Shiryō Nihon Gendaishi*, (*Materials of the Contemporary Japanese History*), Otsuki Shoten, 1981, p.597.

²² Concerning the New Economic System, see T.Okazaki, “Corporate Governance,” in T. Okazaki and M. Okuno-Fujiwara eds. *The Japanese Economic System* op cit.

²³ Kanda, *Shiryō*, p.604; Sakurabayashi, *Sangyohokokukai*, p.12; Nishinarita, *Kindai Nihon*. Pp.400-401.

focusing on labor conditions.”²⁴ However, this document did not reject the idea that *sanpo* meetings played a role in the moderation of labor relations, and also stressed that *sanpo* meetings should be utilized more effectively.

As a matter of fact, the government authorities retained high expectations that *sanpo* would continue to function as a moderating influence on labor relations, and greatly valued the role it was actually playing. A report by a judge of the Nagoya Regional Court, Hisaaki Okagaki, contains a lot of useful information about the views of the government authorities on *sanpo*.²⁵ A document issued by the Tokyo Metropolitan Police wrote about the functions of the *sanpo* system as follows:

It is readily evident that the *sanpo* movement has spawned many *sanpo* units at individual establishments in a year or so, and has been exerting a positive influence on various aspects of the industrial labor relations and society. -- Omission-- Consequently, harmonization between employers and employees, saving money and resources, and preventing industrial accidents have been gradually realized, which, in turn, has lifted morale in the work place. These are desirable phenomena. Also, this positive state of affairs has been directly reflected in production to enhance efficiency, improve work processes, upgrade technology, and develop a cooperative working environment. It is notable that these have had substantial positive effect on technology and production. Furthermore, concerning labor management, improvements in personnel administration, rationalization of labor conditions, establishment of welfare organizations and communication have been realized, which have been effective in addressing complaints, excluding conflicts and resolving class confrontations.²⁶

We can say that, aside from the official line, the Metropolitan Police recognized that class confrontation was a reality, and that the *sanpo* system had been helping to resolve workers' complaints including labor conditions as well as contributing to the improvement of productivity.

On the other hand, Okagaki's report also cited articles critical of *sanpo*. An article written by Masami Matsuzaki, a bureaucrat at the Ministry of Welfare, falls into this category. It is true that this article criticized management of *sanpo* meetings at some firms, but it concluded “generally speaking, we cannot deny that due to the establishment of *sanpo* meetings, opportunities for frank discussions have been given to employers and employees, which have generated a sense of personal trust between the two parties and have been helping to raise morale in the work place. Specifically, it is clearly observed that active utilization of *sanpo* meetings has been effective in preventing and resolving labor

²⁴ Sakurabayashi, *Sangyo Hokokukai*, p.12.

²⁵ H. Okagaki, *Shina Jihen kano Rodo Undo (Labor Movement under the Sino-Japanese War)*, 1941, reprinted in 1971, Toyko, Toyo Bunkasha

²⁶ Ibid, p.485.

disputes”.²⁷ As evidence, Matsuzaki wrote, “by referring to the fact that labor disputes have frequently occurred at those factories where the *sanpo* movement is relatively inactive and both employers and employees are indifferent to the holding of *sanpo* meetings, we can presume that *sanpo* meetings are effective in preventing and resolving labor disputes.”²⁸

Finally, Okagaki’s report cited a document issued by the Police Bureau of the Ministry of Domestic Affairs, “Sangyo Hokoku Undo Gaikan” (An Overview of the *Sanpo* Movement). In this document, the Police Bureau concluded that *sanpo* had three major effects. First, *sanpo* contributed to industrial productivity: “It is thought to be one of the achievements of the *sanpo* movement that under the prevailing bad social and economic conditions, productivity has been maintained at the present level, and that some establishments are even achieving higher levels of productivity than before.” Second, *sanpo* has contributed to both preventing and resolving labor disputes: “The gap between prices and wages, which is the major cause of labor disputes, is presently the widest it has ever been, and there is a ample justification for an explosion in the number of labor disputes. However, labor disputes have been kept down to a reasonable level. This is partly because of the emergent situation, but we need to recognize that the *sanpo* movement convinced employers and employees that disputes were anti-state, and that the causes of disputes have also been removed [in some cases] by utilizing *sanpo* meetings. Also, we can regard as an achievement of this movement the fact that there are many cases where the expansion of disputes was checked and they were resolved quickly, owing to the *sanpo* meetings.” Third, “as the *sanpo* movement requires the establishment of personal trust between employers and employees, it has increased opportunities for contacts between them. As a result, trust and understanding have gradually grown, which in turn has improved the overall atmosphere in work places.”²⁹

All of the documents cited above indicate that the government authorities had high expectations of and positively evaluated the functions of *sanpo*, especially the capacity of *sanpo* meetings to prevent disputes and to enhance productivity, at least until 1940-1941. Moreover, this kind of evaluation was not limited to government authorities. Tadao Kikukawa, the ex-general secretary of the Japan Federation of Labor, the largest federation of labor unions, argued against the position that *sanpo* was not only ineffective in preventing labor disputes but also caused them. He said, “Facts clearly indicate that labor disputes have been prevented by the *sanpo* movement. In those prefectures where the *sanpo* movement has proliferated, for example in Tokyo, the number of disputes has been declining over the last two years. On the other hand, in those prefectures where disputes have increased since last year, the growth of the *sanpo* movement has generally been limited.”³⁰

²⁷ Ibid, p.550.

²⁸ Ibid, p.570.

²⁹ Ibid, pp.576-578.,

³⁰ Ibid, pp.555-556.

4. Function of *sanpo*: Quantitative analyses

The article by Kikukawa cited in the previous section gives us a good starting point for a quantitative analysis. He focused on the relationship between the *sanpo* movement and labor disputes at the prefectural level. We can formally test his casual observation using the following data. Monthly prefectural data on labor dispute participants, and semiannual prefectural data on the labor force are available in various issues of the *Rodo Jiho (Labor Bulletin)* released by the Ministry of Welfare. Also, from June 1939, the monthly prefectural data on the number of *sanpo* members are available from the same source. Based on these data, we constructed panel data for 47 prefectures for * 5 semiannual periods from 1940.1-6 to 1942.1-6, with respect to the dispute participation ratio (the participants of disputes/the total labor force excluding agriculture, forestry and fishery workers, DISPUTE) and the ratio of *sanpo* members to the total labor force (excluding agriculture, forestry and fishery workers, SANPO). Out of these, the eight observations where SANPO>1 were excluded. The basic statistics are shown in Table 1. Using the data, we estimate the following equation.

$$\text{DISPUTE}_{it} = a_0 + a_1 \text{SANPO}_{it-1} + a_2 \text{MALE}_{it-1} + \sum a_t * \text{PERIOD}_t + \sum a_i * \text{PREFE}_i + e_{it} \quad (1)$$

MALE, PERIOD and PREFE refer to the ratio of male workers, the semiannual period dummies, and the prefecture dummies, respectively, and e is an error term. The subscript i indicates prefecture and t indicates period. Because DISPUTE is zero for 61 observations, I estimate equation (1) using Tobit model. The results are reported in Table 2. In equation (1)-1, a_1 is negative as expected, but not statistically significant. In equation (1)-2, the interaction terms SANPO and PERIOD were added, and the a_1 coefficient was positive but not significant. On the other hand, the interaction term with the period dummy for the second half of 1940 and first half of 1941 were negative and significant. Also, the sum of a_1 and the coefficient of each of these interaction terms was negative suggesting that *sanpo* contributed to reducing the participation of workers in labor disputes.

Next, we examine the effect of *sanpo* on labor productivity. Based on the various issues of *Kojo Tokeihyo (Manufacturing Census)* by the Ministry of Commerce and Industry, we constructed panel data on 47 prefectures for * 3 years from 1940 to 1942 with respect to production output, labor force, and number of factories. Here, 19 observations where SANPO>1, were excluded and using the data we estimated equation (2).

$$\text{PROD}_{it} = b_0 + b_1 \text{SANPO}_{it-1} + b_2 \text{MALE}_{it} + b_3 \text{SCALE}_{it} + \sum b_t \text{YEAR}_t + \sum b_i \text{PREFE}_i + e_{it}$$

PROD refers to labor productivity, namely production output/labor force, SCALE refers to the average number of workers per factory, and YEAR is the year dummies. The basic statistics and estimation results are reported in Table 3 and Table 4. In equation (2)-1 b_1 is positive and statistically significant,

which means *sanpo* had a positive effect on labor productivity. Moreover, as discussed above, *sanpo* had the capacity to prevent labor disputes, and the increased labor productivity is therefore thought to be composed of the fractional decrease in disputes coupled with fractional contributions by the other effects. Where DISPUTE is added to equation (2)-1 (equation (2)-2), the coefficient of DISPUTE is negative as expected but not statistically significant, and shows only a slight decrease, which implies that the positive effect of *sanpo* on labor productivity is basically due to mechanisms other than the prevention of disputes. In order to verify the effect of *sanpo* over time, we add the interaction term, SANPO and the year dummies. The coefficients of the interaction terms with the 1941 and 1942 dummies are negative but not statistically significant, and the magnitude and significance of b_1 did not change substantially. We can say that the labor productivity effect of *sanpo* was sustained from 1940 to 1942.

To this point, we have used prefectural data. Next, we will examine firm and establishment level data. For this purpose, firm and establishment information on *sanpo* is necessary. Fortunately, *Rodo Jiho* records the name and the founding date of each *sanpo* unit established from July 1938 to July 1939 by an establishment or firm. Matching this data with other relevant firm or establishment data, we can ascertain the effect of *sanpo* on productivity.

There are few industries for which detailed firm or establishment production data are available at frequent time intervals. One of them is the cotton spinning industry. Monthly firm production data, number of operating machines, consumption of raw cotton, and number of workers by sex, are available in *Dainihon Meishi Boseki Rengokai Geppo (Monthly Bulletin of Japan Cotton Spinning Association)*. Using these data, we derived the following Cobb-Douglas type production function, to examine if *sanpo* shifted the function or not.

$$\log(Y_{it}) = c_0 + c_1 \text{SANPO}_{it-1} + c_2 \log(K_{it}) + c_3 \log(L_{it}) + c_4 \log(R_{it}) + \sum c_t * \text{MONTH}_t + \sum c_i * \text{FIRM}_i + e_{it} \quad (3)$$

Y , K , L and M denote production of cotton yarn, number of operating machines, number of workers and consumption of raw cotton, respectively. MONTH are the month dummies, and FIRM are firm dummies. SANPO_{it-1} is a dummy variable, which equals 1 if there was a *sanpo* unit in firm i at the end of month $t-1$, and 0 otherwise. Those firms where the *sanpo* unit was organized by the establishment, whether or not the firm had a *sanpo* unit was confirmed, and if there was a *sanpo* unit in at least one establishment of the firm. If c_1 is positive, *sanpo* brought about an upward shift in the production function, or in other words, *sanpo* enhanced the total factor productivity (TFP).

The sample used was 59 firms whose production data were continuously available from January 1938 to December 1939. Concerning these firms we constructed panel data from January 1938 to

August 1939. To standardize for any sex-related efficiency discrepancy we converted male workers into female workers based on the wage ratio (the male wage/the female wage). The monthly wage data on the cotton spinning industry by sex are collected from *Rodo Tokei (Labor Statistics)* by the Bank of Japan. The basic statistics and estimation results of equation(3) are reported in Table 5 and Table 6. The coefficient c_1 is positive and statistically significant with a value of 0.031 suggesting that *sanpo* increased TFP by 3.1%.

It was fortunate that detailed data were available on the cotton spinning industry at frequent time intervals, but the data was restricted in its applicability as most of the workers were female. Also, as it was not designated by the Employment Restriction Act, we cannot examine the influence of restrictions on inter-firm labor transfers discussed in the previous sections. Due to these limitations, we next used data on the coal mining industry. The issues of *Honpo Kogyo no Susei (The Trend of the Japanese Mining Industry)* by the Ministry of Commerce and Industry contain the mining (establishment) data on production and workers. From this source, panel data from 1937 to 1940 was constructed. The number of workers employed in the mines changed by year, and in this sense it is an unbalanced panel. Using this data, the following equation on labor productivity was estimated.

$$\text{PROD}_{it} = d_0 + d_1 \text{SANPO}_{it-1} + d_2 \log Y_{it} + \sum b_i \text{MINE} + \sum b_t \text{YEAR} + e_{it} \quad (4)$$

PROD refers to labor productivity (coal production/workers). MINE is the mine dummies. SANPO_{it-1} is a dummy variable which equals 1, if there was a *sanpo* unit at mine i at the end of the previous year. In 1939, due to limited availability of data, this dummy variable equals 1 if there was a *sanpo* unit at the end of July 1939. The basic statistics and estimation results are shown in Table 7 and Table 8. In equation(4)-1, d_1 is positive, but not statistically significant. In equation (4)-2, the interaction terms of SANPO and YEAR are added producing d_1 as negative and statistically significant, but the interaction term with the 1939 and 1940 dummies were positive and statistically significant. In addition, the absolute value for each interaction term coefficient is larger than d_1 . This means that whereas *sanpo* had a negative effect on labor productivity in 1938, the effect of *sanpo* on labor productivity was positive in 1939 and 1940. As mentioned in section 2, inter-firm [transfer][shifting] of workers was regulated from March 1939 with respect to [a number of][the] industries including coal mining. The above result suggests that the positive effect of *sanpo* on labor productivity was realized after the implementation of the regulation, which is consistent with the hypothesis in section 1 that *sanpo* complemented the restriction on inter-firm labor transfers.

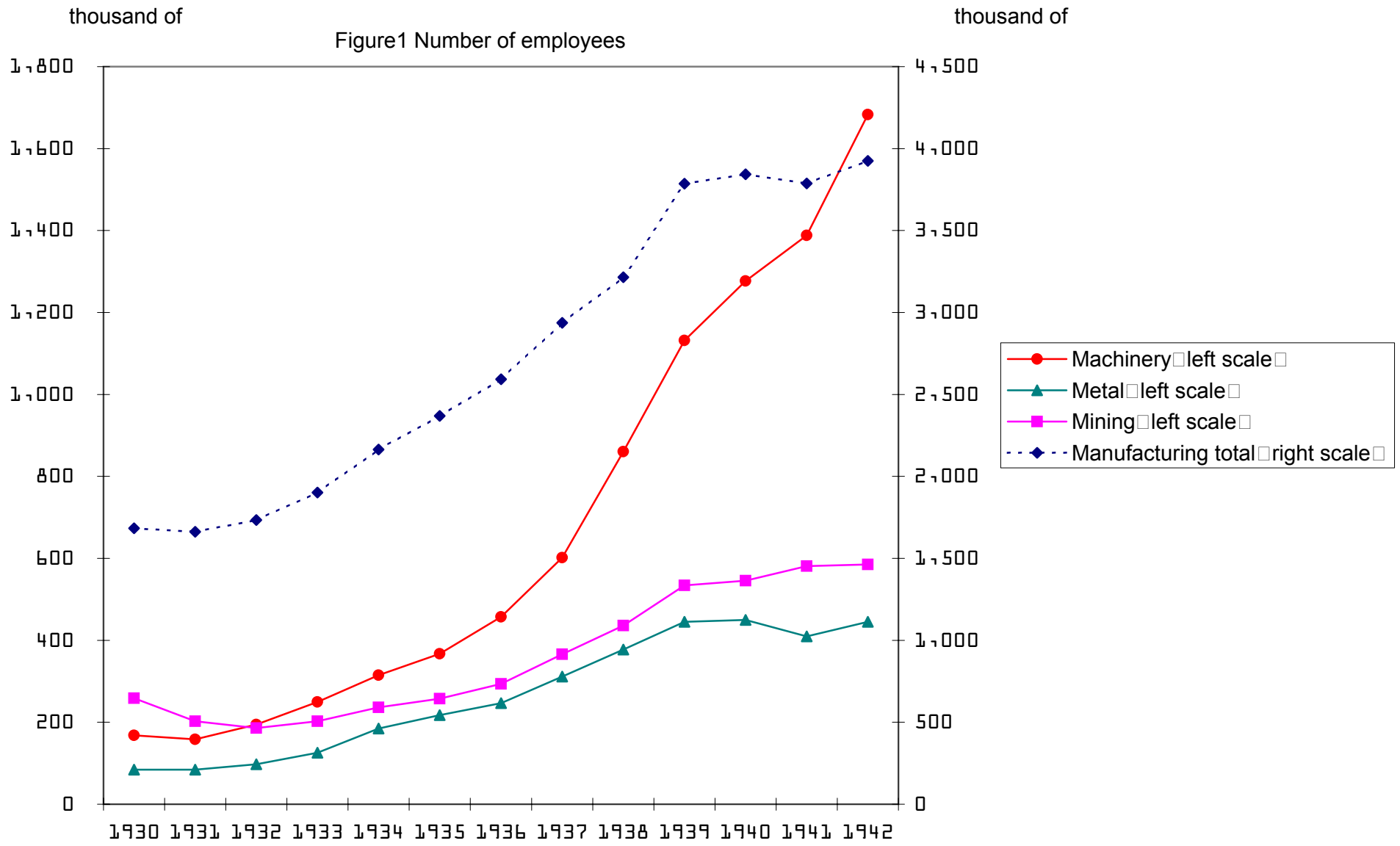
5. Concluding Remarks

Many articles and books have been written on *sanpo*. However, there has been no attempt to evaluate *sanpo* quantitatively. As mentioned in section 1, most of the recent literature has evaluated

the function of *sanpo* in negative terms, but they have basically relied on a small number of case studies or negative contemporary observations. But, as discussed in section 3, there is a significant body of anecdotal evidence which indicates that *sanpo* had substantial positive effects in terms of preventing labor disputes and enhancing efficiency. In order to finally resolve this question, quantitative examinations are necessary. This paper is the first attempt to do this.

According to the analysis of prefectural data, *sanpo* reduced the level of participation in labor disputes until around 1941, and enhanced labor productivity until 1942. Also, estimating production function by monthly firm level data from the cotton spinning industry, we found that *sanpo* increased TFP by 3.1%. From the annual establishment level data from the coal mining industry, we can confirm that *sanpo* enhanced labor productivity.

In this paper, these results were interpreted within a framework that integrated the voice view of unionism advanced by Freeman et al. and transaction cost economics. Those effects of *sanpo* confirmed in this paper are consistent with the hypothesis that *sanpo* provided the workers with a collective voice. The significance of this collective voice mechanism was arguably greater in wartime Japan, because inter-firm labor transfers were regulated and at the same time employees were trained to become skilled workers with “intellectual skill” inside each firm. The results with respect to the coal mining industry that *sanpo* had not been effective until 1939, are consistent with this hypothesis.



Number of disputes

Figure 2 Labor disputes

Number of participants

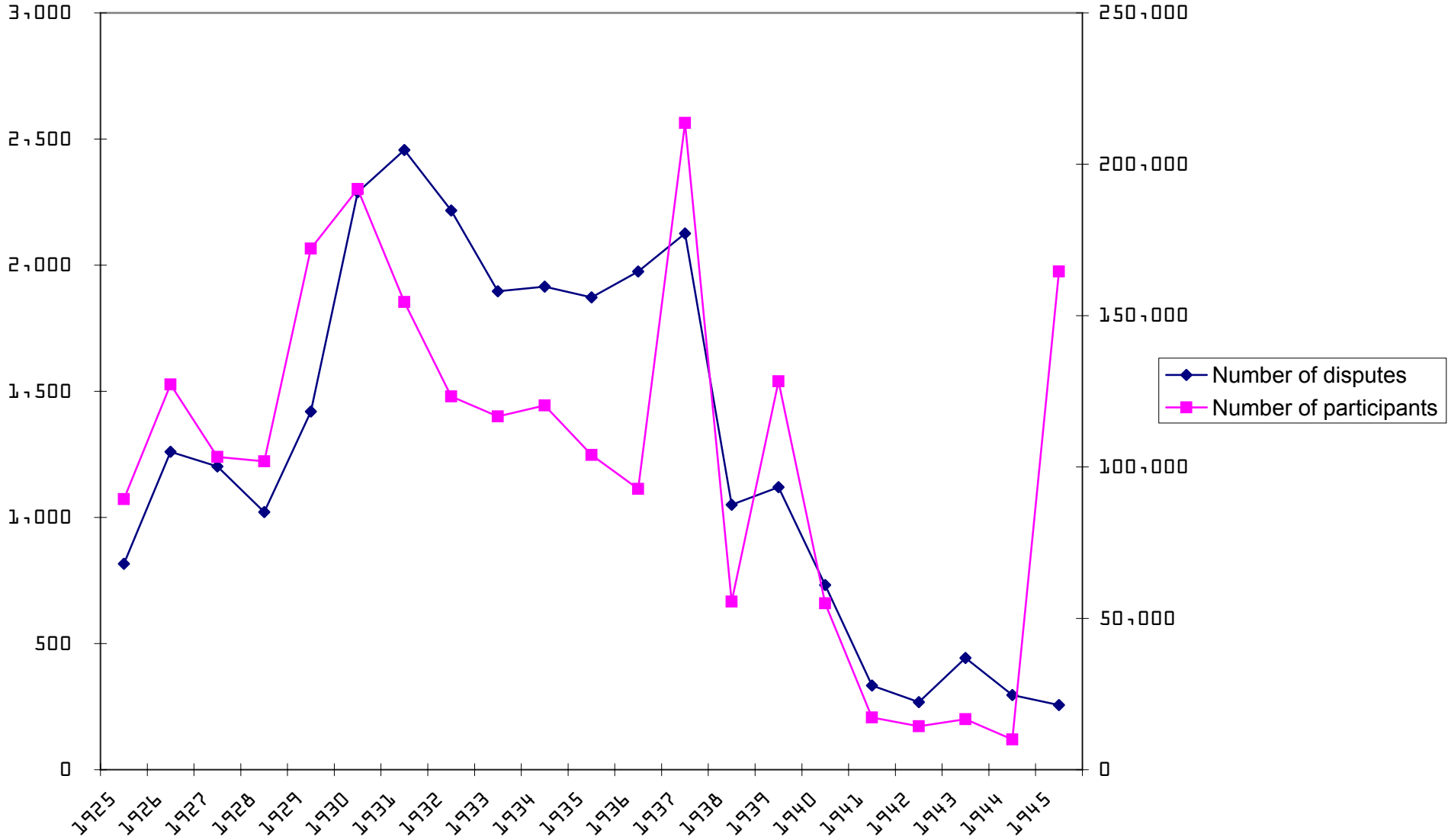


Table 1 Basic statistics on labor disputes

	DISPUTE	MALE(-1)	SANPO(-1)
Average	0.00272	0.684	0.646
Stdev	0.00585	0.119	0.182
Max	0.06366	0.904	0.995
Min	0.00000	(-0.287)	0.163 (0.557)
		(-0.1885)	(0.240)
Source: See the text.		(1.529)	
		(-1.899)	
		(-3.141)	
		(-4.058)	
		(-3.694)	

Table 2 Effect of sanpo on labor disputes

Dependent variable \square DISPUTE

Method of estimation \square TOBIT

	(1)-1		(1)-2	
Constant	-0.00469	(-0.287)	-0.00908	(0.557)
SANPO(-1)	-0.00098	(-0.1885)	0.00125	(0.240)
MALE(-1)	0.03367	(1.529)	0.01876	(0.863)
1940L	-0.00244	(-1.899)	0.00684	(1.451)
1941F	-0.00551	(-3.141)	0.00539	(1.298)
1941L	-0.00775	(-4.058)	-0.01340	(-2.082)
1942F	-0.00704	(-3.694)	-0.13000	(-3.207)
SANPO(-1)*1940L			-0.13200	(-2.061)
SANPO(-1)*1941F			-0.14800	(-2.777)
SANPO(-1)*1941L			0.00729	(0.883)
SANPO(-1)*1942F			0.00413	(1.454)
Log of Likelihood	597.448		605.061	
Observations	227		227	

Note: See the text. t-values are in parentheses.

\square \square Prefecture dummies are included, although not reported.

Table 3 Basic statistics on labor productivity by prefecture

	PROD	SCALE	MALE	DISPUTE	SANPO(-1)
Average	6,342	29.466	0.588	0.006	0.672
Stdev	2,707	23.640	0.147	0.011	0.206
Max	18,119	239.053	0.872	0.082	0.995
Min	553	(-0.287)	0.055	(0.557)	0.165

(-0.1885) (0.240)

Source: See the text. (1.529)

(-1.899)

(-3.141)

(-4.058)

(-3.694)

Table 4 Effect of sanpo on labor productivity □ Prefecture level data of manufacturing

Dependent variable □ PROD

Method of estimation □ OLS

	(1)-1	(1)-2	(1)-3	(1)-4
Constant	-3701.440	(-0.287) -4192.600	(0.557) -2995.260	(-1.068) -3577.500
SANPO(-1)	1178.620	(-0.1885) 2818.440	(0.240) 1742.430	(2.423) 2730.590
MALE	13370.200	(1.529) 13453.900	(3.702) 13031.600	(3.564) 13210.000
SCALE	11.411	(-1.899) 10.488	(0.954) 10.638	(0.992) 10.047
1941	-286.681	(-3.141) 674.383	(0.548) -304.539	(-1.015) 680.203
1942	-656.682	(-4.058) 293.759	(0.217) -735.950	(-2.175) 113.435
SANPO(-1)*1941		(-3.694) -1612.120	(-0.963)	-1623.920
SANPO(-1)*1942		-1581.440	(-0.803)	-1420.050
DISPUTE			-9261.390	(-0.520) -8267.030
adR2	0.872		0.871	0.871
Log of Likelihood	-987.124		-976.829	-977.721
Observations	122		122	122

Note: See the text. T-values by White heteroscedasticity estimator of standard deviation are in parentheses. Prefecture dummies are included, although not reported.

Table 5 Basic Statistics on production function of cotton spinning industry

	ln(Y)	ln(K)	ln(L)	ln(M)	SANPO
Average	4.913	4.705	3.093	4.966	0.303
Stdev	0.581	0.593	0.492	0.576	0.460
Max	6.357	6.270	4.328	6.409	1.000
Min	3.522	(-0.287)	2.172	(0.557)	0.000

Source: See the text.

(-0.1885) (0.240)

(1.529)

(-1.899)

(-3.141)

(-4.058)

(-3.694)

Table 6 Production function of cotton spinning industry

Dependent variable: $\log(Y)$

Method of estimation: OLS

Constant	1.340	(8.181)
SANPO(-1)	0.031	(2.032)
$\log(K)$	0.498	(16.277)
$\log(L)$	0.391	(9.519)
$\log(M)$	0.151	(4.650)
adR2	0.988	
log likelihood	630.537	
Observations	1180	

Note: See the text.

T-values by White heteroscedasticity robust estimator of standard deviation are in parentheses.

Month dummies and firm dummies are included, although not reported.

Table 7 Basic Statistics on labor productivity of coal mines

	PROD	log(Y)	SANPO(-1)
Average	169.775	11.096	0.125
Stdev	131.703	1.348	0.330
Max	2677.514	15.094	1.000
Min	17.298	8.323	0.000

Source: See the text.

Table 8 Effect of sanpo on labor productivity: Establishment level data of coal mining industry

Dependent variable: EFFIC

Method of estimation: OLS

	(1)-1		(1)-2	
Constant	-792.598	(-2.093)	-792.462	(-2.089)
SANPO(-1)	9.392	(0.837)	-53.824	(-2.510)
LogY	65.741	(2.614)	65.737	(2.610)
1938	-1.061	(-0.102)	-0.778	(-0.074)
1939	-17.839	(-2.850)	-17.850	(-2.833)
1940	-26.328	(-3.163)	-26.927	(-3.506)
SANPO(-1)*1939			63.109	(1.890)
SANPO(-1)*1940			64.520	(2.806)
adR2	0.614		0.613	
Log of Likelihood	-5690.2		-5689.8	
Observation	1019		1019	

Note □ See the text.

T-values by White heteroscedasticity robust estimator of standard deviation are in parentheses.

Mine dummies are included, although not reported.